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# AN ASSESSMENT

# OF

# STATE AND COMMUNITY HIGHWAY SAFETY PROGRAMS

## FY 1975 - FY 1979

JANUARY 1980

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

# HIGHLIGHTS OF THE REPORT

## Introduction (Chapter I)

This report responds to a 1979 request by the House Appropriations Committee to provide a cost performance/effectiveness assessment of the Section 402 State and Community Highway Safety Grants Program. Specifically, the Committee requested that National Highway Traffic Safety Administration (NHTSA) report before January 1, 1980, "on how the States have utilized these funds during the past five years, what standards NHTSA uses to evaluate the effectiveness of the expenditure of these funds, and NHTSA's conclusions concerning the benefits of these expenditures."

The primary focus of the report is on program costs and benefits for the past five years (FYs 1975-79) with concentration on the nine program areas which utilize 90-95 percent of the 402 funds. Special attention is also given to those areas for which Congress made available High Payoff Funds. The highway safety problem is characterized as being especially formidable and challenging as a result of the changing environment in which accidents occur, the diverse and complex nature of factors contributing to crashes and the difficulties inherent in effecting behavioral and attitudinal changes.

The interrelationships and the synergistic effects of the Federal, State and local program efforts under the 402 grant mechanism are summarized, including brief mention of the products developed under the Section 403 Research, Development and Demonstration Program. Finally, it expands on earlier evaluations done in 1973 and 1975 and reflects consideration of other program evaluations responding to specific Congressional concerns submitted in 1976 and 1977.

## NHTSA Effectiveness Criteria (Chapter II)

The major criteria that NHTSA has used -- since inception of the Federal/State Highway Safety Program -- to evaluate the effectiveness of highway safety grant program expenditures are:

- The quantity and quality of highway safety program activity; i.e., what was acquired and what resulted in terms of increased levels of effort.
- The stimulus effect of 402 grant funds; i.e., what activities were initiated and continued or expanded with State and local funds.
- The extent of fatal and injury accident reduction which occurred as a result of 402 activity; and
- The ability to respond to changing priorities and problems, i.e., can Federal 402 dollars be flexibly used as national and State priorities change

Obviously, the best effectiveness criterion to be used with the State and Community Highway Safety Program is the reduction in crashes; injuries and

fatalities that result from Section 402 expenditures. Unfortunately, the dynamic environment in which crashes occur, the diverse and complex nature of the factors contributing to crashes, and the lack of solid empirical data confounded by factors over which government has no control, all combine to make it extremely difficult in a truly scientific way to relate combined human factors oriented safety program activities to this illusive "bottom line" of accident reduction.

This is not to say that the program has not inspired safety in the States, but rather an admission of the difficulty in producing statistically verifiable data which convincingly demonstrates that the total 402 program, which on the average represents only 2 percent of each State's expenditures on highway safety, has significantly contributed to a reduction in crashes, deaths and injuries. This trend promises to increase. Based on our review of information received from the States, the States are responding to new program information and opportunities to redirect their efforts, with potentially more beneficial effects.

**How the 402 Dollars are Spent** (Chapter III)

The distribution of obligations among the program areas for two time periods -- FY 1967-74 and FY 1975-79 -- are compared to allow an assessment of program change and maturity. The distribution of funds in the earlier period reflects the start-up aspect of many of the program areas...for example, purchase of sophisticated data processing and recordkeeping equipment for traffic records and driver trainers and range facilities for driver education.

In later years, emphasis has shifted showing significant percentage increases in pedestrian safety, motorcycle safety, police traffic services and alcohol safety -- areas with high potential for reducing accidents. Obligations for planning and administration significantly increased reflecting the increased scope of leadership expected of the State highway safety agencies.

The trends in 402 program funding allocation reflect a good response to national priorities as indicated by proportionate increases between the first and last half of the '70s in Police Traffic Services (for 55 mph and alcohol safety enforcement), and in Alcohol Safety (for court, educational and public information programs). They also reflect state of the art limitations as in pedestrian safety where the very small proportional share of 402 funds has remained approximately the same because of the lack of proven countermeasures.

Each State's total highway safety program consists of an aggregation of individual State and local projects in each program area. To better understand and appreciate the diversity and qualitative aspects of highway safety activities which involve 402 funding, the kinds of projects that are typically implemented have been summarized by each NHTSA Region. These summaries include a problem and a program description, and in many cases the evaluation results made of the project by the State.

**The Effectiveness of the State and Community Program on Fatal and Injury Accident Reduction** (Chapter IV)

The difficulties in measuring the accident reduction effectiveness of the 402 program are well known. It is frequently not possible to measure the effectiveness of even those projects which are designed to have a direct effect on the crash environment for these reasons:

- Most 402 projects, while designed to leverage larger State efforts, may be too small in themselves to show injury and death prevention through crash reduction.

- Since 402 projects are designed to prevent accidents, it is necessary to prove that the safety measure did forestall a crash that otherwise would have occurred. However, since so many factors (roadways, vehicles, weather, fuel shortages, economic conditions) may produce or prevent accidents, the effect of the safety program of interest may be obscured.

- Funds and qualified evaluation personnel may not be available to determine 402 results.

A scientific evaluation of the effect of a safety program on crash reduction is very expensive because of the many factors which require an elaborate research design to control. As a result, only a few State reports, to date, provide acceptable evaluations of accident reduction effectiveness.

Despite these limitations, evidence of effectiveness is accumulating. It is interesting to note that the historic upward trend in highway fatalities leveled off at about the time the Department of Transportation was established, and that the number of fatalities actually fell following the fuel crisis of 1973. A number of factors have contributed to this holding down of the fatality level, among them the interstate construction program and new vehicle safety standards. While it is not possible to isolate the contribution of the 402 program, it appears that this Federal/State cooperative program may also have had some impact on the national trend. It is well documented that the 402 program helped to reduce fatalities related to speeding and helmet usage.

The evidence for the effectiveness of the 402 effort is clearest in the case of programs directed at the 55 mph law and the motorcycle helmet usage laws. Studies of data from several States have shown reduced fatalities on high speed roadways when the limit was decreased, in contrast to the low speed roadways which were unaffected by the speed limit change. The effectiveness of helmet usage laws has been shown by the increase in fatal head injuries motorcyclists are experiencing as a result of legislative repeal or revision action taken by 27 States since 1976. This effectiveness is documented in the Secretary of Transportation's Report to Congress -- A Case for Helmet Use.

Overall it is clear that adequate evaluation studies are beginning to be made by the States. In part this is because data systems are maturing, and the States are building their evaluation capability in response to the

NHTSA requirement for evaluation in the new highway safety plan development system. The next few years should see an increase in the numbers of scientific evaluations of 402 programs, and as a result, it should be possible to obtain a better estimate of the cost effectiveness of the State and community program.

**Stimulus and Growth Effect of 402 Program on State Safety Activities** (Chapter V)

During its first decade of existence, the State and Community Program was highly successful in stimulating the States to adopt the basic elements of the 18 Highway Safety Standards. Since the enactment of the Highway Safety Act of 1976, which removed from the Secretary the responsibility of requiring States to implement all Standards and all elements of the Standards and reduced his authority to sanction States in certain areas (motorcycle helmet usage laws), there has been some retrogression in Standards implementation, especially in the area of periodic motor vehicle inspection, helmet usage laws and driver education. However, the great majority of the Standards remain in force as a basis for future highway safety growth. By monitoring State legislative developments, acquiring and communicating program effectiveness information and providing expert testimony, NHTSA was able to forestall regressive legislation in a number of States this past year, especially regarding repeal of helmet laws and weakening enforcement of the 55 mph speed limit.

Additionally, we have continued to direct attention to those Standard elements which are significant for national uniformity. Those standards include; Rules of the Road, Driver Licensing, Motor Vehicle Registration and Titling, and Traffic Records.

Aside from Standards implementation, the State and Community Program has been effective in leveraging the total State efforts as indicated by the growth of program elements (such as BAC testing, implied consent, presumptive evidence, personnel qualifications and specimen procedures under the Alcohol Program Standard) which the NHTSA has been encouraging through 402 grants. The new highway safety problem solving approach being used to manage the 402 grant program requires the States to focus on problem identification, then to select and implement safety programs, and finally to evaluate the impact of those programs on accidents and operations. This new emphasis on evaluation and problem identification should help the state highway safety office influence the expenditure of non-Federal funds to a greater extent than in the past. This process offers significant potential for achieving the most effective use of 402 funds. However, all States are not fully capable of implementing this approach at this time. Nevertheless, improvements are being realized.

**Conclusions**

As a result of the review presented in this report, it appears fair to conclude that the State and Community Program has:

1. Shown growth in the quantity and quality of State highway safety programs initiated;

2. Reduced death and injury on the nation's highways through programs undertaken with Section 402 funds or stimulated by the 402 program;

3. Catalyzed State efforts in dealing with high priority safety problems and influenced State and local funding for safety programs;

4. Created the potential for further increasing the effectiveness of both State and local 402 highway safety funds under the management process currently being applied to State planning activities as a condition of grant approval.

# CHAPTER 1
# INTRODUCTION

## Purpose and Content of Report

This report responds to a request by the House Appropriations Committee to provide a performance/effectiveness assessment of the Section 402 State and Community Highway Safety Grants Program. Specifically House Report 96-272 which accompanied 1980 budgetary decisions stated that:

> "The Committee is fully supportive of the objectives of the State and community grants program, however, the Committee is also mindful of the rising demands for greater restraints on Federal spending and for a balanced Federal budget and found a paucity of evidence as to the degree of improved highway safety resulting from this program. The cost of the State and community grants program has grown substantially during the last five years. The Committee requests that NHTSA report to the Committee before January 1, 1980, on how the States have utilized these funds during the past five years, what standards NHTSA uses to evaluate the effectiveness of the expenditure of these funds, and NHTSA's conclusions concerning the benefits of these expenditures."

Therefore the primary focus of this report is on program costs/benefits for the last five years -- fiscal years 1975 through 1979. The analysis of how States utilized grant funds begins with an overview of all program areas and then concentrates on the nine program areas which utilized 90-95 percent of the 402 funds made available to the States and communities during this time period. The nine major program areas are:

- Planning and Administration
- Driver Education (Standard 4)
- Driver Licensing (Standard 5)
- Alcohol Safety (Standard 8)
- Traffic Records (Standard 10)
- Emergency Medical Services (Standard 11)
- Pedestrian Safety (Standard 14)
- Police Traffic Services (includes 55 mph and alcohol enforcement) (Standard 15)
- School Bus Safety (includes Section 406) (Standard 17)

Special attention is also given in this assessment to funding of "high payoff" areas. High Payoff Funds were first made available in FY 1976 by the Congress. These funds were specially appropriated under Section 402 and obligated for control of the drinking driver, speed limit enforcement, emergency medical services and other areas aimed directly at accident fatality and injury reductions.

Among the key funding concerns addressed are:

- Trends in 402 funding in each program area, with analysis of whether 402 funds provided leadership in countering major problems and upgrading safety systems;

- Degree to which States and localities committed their own funds to match the Federal grants; and

- State decisions on allocating funds to high payoff programs to reduce accident occurrence and injury severity.

In developing these financial trends, the National Highway Traffic Safety Administration (NHTSA) has looked at obligations of 402 funds rather than expenditures. These were derived from the NHTSA Financial Management Information and Accounting System (FMIAS) and represent a complete and up-to-date profile of State 402 funding decisions. Since expenditures represent vouchers for costs incurred by the States, accountability of actual expenditures normally lags information on obligations by one to two years. Thus, obligations offered the best means of satisfying Congress' request for information through FY 1979.

With regard to examining program benefits, two approaches have been employed in reaching the conclusions presented. First, we have measured the performance of the major programs which account for about 95 percent of 402 usage using selected and generally accepted program performance indicators. Second, we have included results of Federal and State program and project evaluations to document their actual crash or injury reduction.

## The Highway Accident Problem

The fundamental problem giving rise to the National Highway Safety Program is the number and extent of motor vehicle accidents, fatalities, and injuries occurring on a daily basis throughout the nation and the associated economic and societal loss. The goal of the State and Community Highway Safety Program is to reduce this problem by improving driver and pedestrian safety performance. It does this through programs designed to modify human behavior rather than through engineering or design changes. Therefore, in some cases program results are long term in coming. The results of a driver education program or a kindergarden through 12th grade safety education program could take up to a decade to show results.

Therefore, the highway accident problem and its adverse effect on the economy and society must be realistically viewed and reckoned with. Motor vehicle traffic crashes now claim approximately 50,000 lives annually, or about 135 lives every day of the year, the equivalent of a major airline disaster each day. This represents about one-half of the deaths due to all types of accidents in the United States and over 90 percent of transportation related fatalities. Motor vehicle crashes are by far the largest killer of people under 24 years of age and are the largest single cause of paraplegia and a major cause of epilepsy. But, fatalities are only part of the problem. Approximately two

million people suffer disabling injuries each year and millions more are injured less severely. People spend three million days in hospitals annually as a result of traffic accidents.

While one can not begin to realistically calculate in monetary terms the grief and suffering that result from this tragic toll, there can be no doubt that the loss to society and the economy is enormous. Production and marketplace losses, costs of medical care, repair costs of vehicle damage, legal, and court costs, accident investigation costs and insurance administration costs are but some of the costs shared by all of us. The resources consumed in these activities could be shifted to raise the existing level of economic and social welfare of society were they not devoted to remedying the damage caused by accidents. The overall loss to society has been estimated to exceed $45 billion per year not counting the nonquantifiable cost of pain and suffering which millions of families experience each year.

Moreover, the dynamic environment in which accidents occur, the relatively limited understanding of the events that cause accidents, the diverse and complex nature of the factors contributing to crashes and the remedies the States apply, the lack of solid empirical data confounded by factors over which government has no control, all combine to make it extremely difficult in a truly scientific way to relate combined human factors oriented safety program activities to the illusive "bottom line" of accident reduction.

This is not to say that these programs undertaken to reduce human involvement in crashes do not improve safety in the States. It is rather an admission of the difficulty in producing statistically verifiable data which convincingly demonstrates what our common sense supported by various proxy measures tells us -- that the total highway safety program has significantly contributed to a reduction in accidents deaths and injuries. While many well defined and controlled individual projects do show verifiable results, these results cannot necessarily be extrapolated beyond the range of that particular project environment.

## Program Overview

The State and Community Grant Program was initiated 12 years ago with the enactment of the Highway Safety Act of 1966. Seventy-five percent of Section 402 funds are apportioned to the States on the basis of population and 25 percent on the basis of public road mileage. At least 40 percent of the funds apportioned are to be spent on political subdivisions of the State in carrying out local highway safety programs. The Act provides for a coordinated national highway safety grant program to be carried out in close cooperation with the States on a matching fund basis together with supporting research, development, and demonstration programs. The Act also provides for the Governor to operate the State highway safety program through a designated State highway safety agency. This agency is to be principally responsible for coordinating the 402 dollars with ongoing and improved State and local highway safety programs.

Congress clearly intended that a Federal/State partnership be formed with the Federal Government providing financial and technical assistance to States and local jurisdictions for developing and carrying out programs designed to reduce the frequency and severity of motor vehicles accidents. The programs developed are implemented, not by the Federal Government, but by State and local agencies. NHTSA, the Federal partner, develops new highway safety technology under Section 403 and makes it available to the States in the form of new program information, materials, devices, techniques, and guidelines. State and local governments conduct the programs and make the day-to-day management decisions needed to ensure effective program implementation and operation.

State and local programs utilizing 402 funds attack a vast array of safety problems, from alcohol safety patrols and school bus driver education to driver licensing and police traffic enforcement. State highway safety programs are a conglomeration of many programs and projects at the State and local level. Unlike many other Federal grant programs, virtually every State department participates in highway safety activities including motor vehicle, enforcement, education, public health, transportation, public works and the judiciary, among others. Obviously, Section 402 funds are used in a wide variety of projects and involve extensive interdepartmental coordination. Programs address a continuum of State needs -- from record system improvements essential for good problem identification and program management to enforcement strategies to detect and apprehend dangerous drivers, licensing and driver improvement programs to control the problem driver and injury severity reduction efforts such as emergency medical and rescue service and promotion of motorcycle helmet and safety belt usage.

States have traditionally emphasized the uniqueness of their respective problems with drinking drivers, traffic enforcement, traffic courts, driver education, and other areas. Laws and policies affecting highway safety not only differ among the States but also within some States among their political subdivisions. For example, drinking laws, enforcement and court policies may vary widely among counties and municipalities within the same State. In addition, both the nature of certain safety problems and State systems to counter them, as well as the perceptions of problems and needs, have changed since the 402 program was enacted in September 1966.

Improvements in the coordination and management of State highway safety programs have occurred. That is not to say that all things are good. Problems still exist in some States regarding the effectiveness of the designated State highway safety agency. In other States, existing line organizations (i.e., Motor Vehicle Administration, State Police/Patrol Agencies, Highway Departments) continue to go their own way without effectively coordinating their program with that of other interested State or local agencies. These problems are being addressed in a current Federal Register Issuance on the Responsibilities and Authorities of the State highway safety agency, in line with the requirements of the 1978 Surface Transportation Act. Unquestionably, because the 402 program is a catalyst program for change and improvement, the key to a continuing effective highway safety program is the level of capability and authority extablished within the designated State highway safety agency.

## Earlier Assessments

This report constitutes the most recent assessment of the 402 grant program. It reflects program developments and achievements from 1975 through 1979, and builds upon earlier evaluations which began in 1973. In October 1973, NHTSA published the Assessment of Selected State and Community Programs. This early assessment focused on the specific uses of the 402 grant from 1968 to 1973, and found considerable evidence that State programs benefited and grew as a result of 402's stimulus effect.

In July 1975 NHTSA issued Statewide Highway Safety Program Assessment: A National Estimate of Performance. This study related expenditure of Federal, State and local funds to measurable improvements in safety performance throughout (such as traffic citations and convictions, emergency rescue responses, drinking driver arrests, students trained in driver education, etc.), resulting from State traffic safety programs during the period FY 1969 - FY 1974. The degree to which 402 funds leveraged State funding growth was an important issue of the assessment. Overall findings demonstrated that safety program performance had grown substantially by 1974, keeping pace with the safety demands imposed by more drivers, vehicles, travel, and roadways.

In 1973 Congress directed NHTSA and the Federal Highway Administration (FHWA) to undertake an assessment of safety program needs and projected costs through 1986. Published as The National Highway Safety Needs Report in March 1976, it examined every program area in terms of its deficiencies, needs for improvement and funding requirements. The key recommendations of this 1976 report were that both Federal and State governments should actively promote the universal use of safety belts and continue to seek strong uniform enforcement of the 55 mph national maximum speed limit. These two countermeasures were reported to have very large payoff potential in terms of accident reduction at a relatively small investment. This comprehensive reassessment and plan provides a blueprint for guiding both Section 402 State and community grants and Section 403 Research, Development, and Demonstration activities into the 1980s.

During 1976 and 1977 NHTSA and FHWA turned their attention to the best method for planning and administering the 402 program. In the 1976 Highway Safety Act, Congress determined that States would no longer be required to implement all elements of Federal 402 Standards. Congress also directed that the two agencies reevaluate the 402 program and develop recommendations for the future of the program. In July 1977, the Department submitted An Evaluation of the Highway Safety Program. Among its more significant findings were recommendations that 402 management move away from mandatory compliance with all the standards. States should instead, adopt a process of safety problem identification and countermeasure selection to fit their own problems. Standards had been beneficial to guide implementation of the national highway safety program after 1966. This review also found that the Standards have played an instrumental role in increasing the level of highway safety efforts among the States. Although Congress did not want to abandon the framework established by the Standards, it believed that some of the Department's recommendations should be introduced into the existing framework to make it more flexible. Accordingly, the Highway Safety Act of 1978 retained the Standards but provided

a basis for an alternate program "for identifying accident causes, adopting measures to reduce accidents, and evaluating the effectiveness of such measures." This process is now being carried out in all States while using the elements of the highway safety standards as the underpinnings of a comprehensive highway safety program.

These previous evaluations and their results serve as the departure point for this current report to Congress. Trends in program performance developed in the earlier studies of 402 funds provide a base against which 1975 through 1979 fund utilization and payoff can be measured and analyzed.

**Conclusions**

Based on our analysis in the following sections of this report it is apparent that the 402 program has contributed in important ways to accident reduction, the prevention of fatalities and injuries, the upgrading of highway safety support systems, the leveraging of State and local efforts, and has provided a mechanism for assuring that the most modern highway safety practices are made available to all levels of State and local governments. All of these things have been realized in spite of the severely eroding effects of inflation in the 1970s, competing program requirements and limited resources at all levels of government.

Moreover, it is apparent that the combined efforts of the Federal Government and State and local jurisdictions have produced a beneficial effect on highway safety greater than any of the entities could have accomplished individually. From the beginning, Congress held that it would be most efficient for the Federal Government to develop new highway safety technology under Section 403 and make it available to the States to avoid duplication among the several States and to accomplish work beyond the budgets of the individual States. This synergistic effect is quite evident in the overall accomplishments of the program. Over the last 12 years, NHTSA has developed a number of important safety countermeasures:

- new equipment such as hand held evidentiary breath testing devices for the police to measure alcohol levels at an accident scene;
- new selective enforcement and resource deployment techniques to facilitate speed limit enforcement;
- new driver education programs for use in secondary schools;
- new licensing and rider training programs for motorcyclists;
- improved ambulance configurations providing better patient access;
- pre-hospital emergency care training for ambulance technicians;
- accident location techniques; and,
- communication systems for improving emergency medical and rescue services.

These countermeasures, among others, have been widely adopted by the States with beneficial results. Solutions to accident problems must necessarily be tailored to individual situations and be applied at the local level. This has been done by most States in a generally effective manner. Projects initiated under the Section 403 Research, Development and Demonstration Program have been continued by States with a combination of their own funds and 402 grants. This "handing off" process provides States with the most up-to-date technical assistance available and provides for a smooth transition to operational status.

# CHAPTER II
# CRITERIA FOR EVALUATING NHTSA 402 GRANT EFFECTIVENESS

Congress has requested as part of the updated assessment of the Section 402 program, that NHTSA discuss "What Standards NHTSA uses to evaluate the effectiveness of the expenditures of these funds," -- the Section 402 State and Community Highway Safety Grant Program funds. It is important that an understanding of the criteria NHTSA uses for evaluating the effectiveness of grant program expenditures precede a discussion of how the funds were utilized and what benefits were realized. Therefore this Chapter discusses the criteria and evaluation NHTSA and the States use to assess the effectiveness of 402 program expenditures.

## NHTSA Effectiveness Criteria

One should be especially conscious that in discussing effectiveness of a human behavior program as opposed to a hardware oriented program there are many constraints under which the program operates.

Some of these constraints are: The Section 402 dollars represent only about 2 percent of the total funds expended in a State for highway safety purposes. The purpose of 402 funds is to provide seed money for new and innovative programs. Results of such efforts may take many years to come to fruition. In the evaluation of a human behavior program it is difficult to isolate variables (such as weather) for measurement purposes. The Governor's Representative for Highway Safety in each State must deal with many different department and agency heads, such as the Chief of Highway Patrol who probably has a budget ten times that of the 402 dollars. In such cases, the Governor's Representative's job is to inform, coordinate, cajole and facilitate change. This presents a difficult and formidable environment in which to work.

Effectiveness measurement is also difficult where we are dealing with pre-crash changes such as driver education. How does one measure accidents prevented? Also, although a countermeasure may have proven results such as mandatory helmet usage, facts and data alone are not enough to assure implementation. Political as well as emotional barriers are sometimes thrust in the way. This doesn't just occur in the mandatory helmet area either. In the area of driver licensing, it is difficult to administer a tough driver control program which includes the ultimate sanction of revocation. A driver's license is looked upon by many as a right rather than an earned privilege.

Finally, in looking at the cost/benefits of this program, it is very difficult to assign, on the benefit side, a number to the life of a small child, for example. To any person, it is worth millions or more!

The major criteria that NHTSA has used -- since inception of the Federal/State Highway Safety Program -- to evaluate the effectiveness of highway safety grant program expenditures are:

- The quantity and quality of highway safety program activity --This criteria is concerned with the manpower and other resources used to address a problem. Is the effort commensurate with the problem? Are the right types of resources being supplied? Is there some correlation between problems and dollars expended?

- o The extent of fatal and injury accident reduction -- What are the projected fatality or injury reduction objectives of the project? What were the actual results?

- o The ability to respond to changing priorities and problems -- Does the planning effort reflect relative priorities as depicted in the analysis of highway safety data.

- o The stimulus effect of 402 grant funds -- What kind of additional effort did the 402 dollars generate?

In the early years of the program emphasis was strictly on implementation of highway safety standards per se, as the enabling legislation, the Highway Safety Act of 1966, required. Progress was measured by the degree to which each State implemented each element of each Standard. Subsequent changes to the legislation in 1976 and 1978, gave the Secretary discretion in the implementation of the standards and allowed the States to implement creative and innovative programs which might be outside the specific standard element, but probably not outside the related program area. Emphasis in program administration has shifted from implementation of all elements of all Standards, across-the-board, to maintaining a specified level of effort in all areas with special effort on those standards that will impact the States fatality and injury picture as depicted through the data analysis process.

The Highway Safety Plan (HSP) embraces the concept of identifying problems through the analysis of statewide traffic records data and/or analysis of the existing traffic safety systems. Countermeasures are then applied to minimize the effect of factors contributing to accidents, fatalities or injuries, and deficiencies in vital traffic safety program functions are corrected.

Care is exercised by the Agency to ensure that the progress made in standard implementation is not permitted to regress as the States work on the problem identification concept. We believe that within the HSP concept there are two levels of effort -- both encompassing standard implementation -- that are critical to and should be an integral part of the highway safety programs of all States. Thus, we require the States to perform a three-tiered HSP development effort.

The first level of effort involves establishing system uniformity from State-to-State. In their analysis of existing traffic safety systems, the States should identify any deficiencies they have in meeting minimum system uniformity requirements for universal application throughout the United States. NHTSA has established four uniformity requirment areas which are to be addressed at the first tier of HPS development:

- o Rules of the Road
- o Driver Licensing
- o Motor Vehicle Equipment, Registration, and Titling
- o Traffic Records

The second tier of development effort involves addressing those problem areas that should surface as a result of the data analysis/problem identification process in virtually every State. They are:

- o 55 mph Compliance Program
- o Safety Belt Usage
- o Alcohol
- o Motorcycle Safety

The Congress has recognized the national importance of both 55 mph speed limit compliance and programs to encourage increased safety belt usage, and has mandated that the States address these problem areas in their highway safety programs. Alcohol and motorcycle accidents continue as national problems and continue as emphasis programs of this Agency.

The third tier of development in a State's HSP involves those additional problems that the State has identified and priority ranked to be addressed within the resources available. This tier affords the State the flexibility needed to ensure a fully comprehensive highway safety program that is responsive to the State's identified needs.

## Evolution of Current Evaluation Approaches

From 1966 until 1976 the degree of program standard implementation constituted the major means of determining whether States were improving their safety programs. The 14+ standards, the majority of which were delineated by Congress in the enabling legislation, comprised NHTSA's primary focus on how to assure effective State use of 402 funds.

Each standard consisted of numerous program elements. Despite growing State concern over certain of these elements, the vast majority were recognized as traditionally sound approaches to safety and system problems. As State highway safety programs gained momentum from the stimulus provided by Federal funds, there came an increasing desire on the part of the State's to assign relative rankings to standards in their programming efforts.

This desire -- combined with the recommendations in the Secretary of Transportation's report entitled "An Evaluation of the Highway Safety Program", produced the current management and evaluation process by which NHTSA administers the 402 grant program. This management and evaluation process, contained in Volume 102, the Highway Safety Plan, requires each State to assess its accident data in the following 14 different areas: pedestrian, motorcycle, pedalcycle, passenger, school bus, truck, problem drivers, roadside and roadway hazards, alcohol involvement, youth involvement, defective vehicle involvement, suspended/revoked driver involvement, safety belt usage and speed involvement. Even with this process the standards still are the underpinnings of program activities. Each of these 14 areas are covered, in someway, by the standards. Based on this analysis countermeasures are selected and projects/programs developed.

Although each State is making the transition to the HSP, we should point out that some States are doing in-depth problem identification and readily understand how to develop countermeasures and projects to ameliorate problems. On the other hand, there are also some States that lack the sophistication and resources necessary to satisfactorily implement this concept. The proposed Federal Register Notice on the requisites for a State highway safety agency will include skills such as data analyst and program evaluator. Section 207(b) of the 1978 Highway Safety Act amended 23 U.S.C. 402 to make it clear that the highway safety program should be administered through a State highway

safety agency. The Report on the Surface Transportation Assistance Act of 1978 states, "The State highway safety agency should also assist State agencies to identify statewide highway safety problems and select the most effective programs for implementation." It is the Agency's belief that in order to carry out these requirements the State highway safety agency must have data analysis and evaluation capabilities.

## Two Types of Problems

The HSP addresses two types of problems: (1) impact (crash reduction) problems, and (2) system support problems. An impact problem is directly related to accidents, fatalities, and/or injuries. For example, analysis of the data shows nighttime accidents on Friday and Saturday evening between 8:00 p.m. and 4:00 a.m. have taken a quantitive leap. This problem would be an impact problem. A system support problem is a deficiency in a vital traffic safety program function, the correction of which may not produce measurable accident/fatality/injury changes but, nonetheless, affects the ability of the system to function adequately. Depending on the nature of the deficiency, system support problems are often as deserving of attention as are impact problems. For example, in order to identify the causes of accidents, it is necessary for a State to analyze large amounts of accident data, sections of roadway, kinds of accidents and their severity. The absence of a good accident investigation program (a systems problem) could lead to a situation where the State will act on hunches without empirical support.

## Two Types of Evaluation

To help assure that Federal grant-in-aid funds are properly administered according to sound management practices , NHTSA and the States employ two types of evaluation:

- Effectiveness Evaluations -- are concerned primarily with the relationship of project activities to changes in crash involvement. The strategies for effectiveness evaluations required in the HSP represent a significant step forward in identifying the contribution 402-funded projects make toward reducing crashes. The HSP constitutes a viable tool for eventually achieving a significant number of effectiveness evaluations in all States. Admittedly, much work remains to be done to encourage this kind of evaluation.

- Administrative (Performance) Evaluations -- are concerned with measuring the operational efficiency of project activities as they relate to the accomplishment of established goals and objectives. In measuring actual performance against that planned, comparisons are made against a baseline or pretask levels of the activity; the targeted levels of activity established; the planned use of funds; and the relationship of costs to the activity level achieved.

Administrative evaluations show changes in State program performance over time. They employ quantified indicators and orderly data collection effort. The establishment of baseline trends brings improvements into sharp focus. Levels of program effort are targeted, and the allocation of funds are planned to contribute to the overall effort. Comparison of initial goals with actual accomplishment very quickly demonstrates whether each program utilizing Federal

grants has improved safety delivery capability or support in each program area receiving funds. Volume 102 requires all 402 funded activities to be administratively evaluated.

## Discussion of Effectiveness Criteria

The program evaluations, both administrative and effectiveness, called for by the Highway Safety Plan and submitted by the States, provide information directly related to the first two elements of our major effectiveness criteria: the quantity and quality of activity, and the extent of fatal and injury accident reduction. For example, the objectives of a selective enforcement project may call for the increase of Driving While Intoxicated arrests on Friday night between 8 pm and 4 am from one per officer to three. This activity can be measured and will be a specific indication of State activity.

A logical consequence of using problem identification and analysis techniques is the improved ability of a State to more readily recognize and respond to changing problems and to reorder its priorities accordingly. Problem analysis and evaluation of solutions as called for in the HSP forces a State to review its program approaches against new data annually and update or discard those approaches that are not relevant to the problems identified, leaving funds available for new and innovative approaches.

The small amount of 402 funds in each State represents about two percent of the amount of funds expended in a State for Highway Safety purposes. The intent is to use this seed money to produce a catalytic effect which is observed primarily from annual program reviews conducted both by the States and NHTSA. These program reviews consider:

- State resource allocations,
- Personnel, facilities and equipment,
- New and improved programs (such as the Yellow Jacket Patrol of the Maryland State Police which deployed overtime police officers on high crash roads),
- Target populations, and
- New safety related legislation.

The following paragraphs briefly describe the major 402 effectiveness criteria used by NHTSA:

- The quantity and quality of highway safety program activity.

  In an attempt to judge the quantity and quality of State program activities, NHTSA uses administrative evaluations in conjunction with HSP submissions as the primary means of quantifying what the Federal dollar has purchased and assessing trends in program performance and overall safety program capabilities. The objective is to develop conclusions about the following concerns: What services, equipment and training were obtained; what program performance trends resulted; what program management improvement occurred; what support system improvements were made; and to what extent did overall program capability increase to counteract the accident picture.

With emphasis on project monitoring and review, NHTSA can periodically assess project plans against actual results. Such assessments will not only show 402 dollars expended but the State/local matching funds.

The initiation in 1978 by NHTSA of the National Project Reporting System will allow us on a national basis to monitor and assess several promising projects and to subsequently transfer this technology to all communities.

o The extent of fatal and injury accident reduction

The primary and most meaningful measure of program effectiveness is the extent to which traffic fatalities and injuries have been reduced. The primary means of assessing this effect is through accident information collected and maintained by NHTSA and individual State program evaluation submissions. In addition to identifying changes in actual numbers of fatalities and injuries, various proxy measures are used to assess accident reduction. Among these are: observed speed of vehicles in relation to speed limit; BAC levels of drivers on the road; observed motorcycle helmet and safety belt usage; and EMS response times.

o The ability to respond to changing problems and priorities

Public officials are often faced with the need to react to new knowledge and situations and change their priorities accordingly. Through the HSP management process which stresses annual problem identification, the States and NHTSA have the capability of identifying new causes of accidents, and have the opportunity to develop new and innovative remedies to these new problems. They should be able to put these findings immediately to work in conjunction with identified needs. Based on our review of information received from the States, a number of factors show that the States are responding to new program information and opportunities to redirect their efforts with benefical effects.

o The stimulus effect of 402 grant funds

The 402 money is intended to initiate new and improved concepts in highway safety which would otherwise not be undertaken. Their use is primarily as start-up funds to foster the implementation of modern techniques and to encourage increased highway safety activities by State and local governments. As a stimulus to spur State involvement and funding, 402 funds have been successful, as is shown in detail in Chapter V. State matching of Federal funds is a significant method of achieving leverage on State programs. Matching trends for 1975-1979 will be presented and analyzed later in this report. The leverage provided by 402 has been substantial, especially given that 402 funds still constitute only a small percentage of the total State/local investment in highway safety.

# CHAPTER III
# HOW THE 402 DOLLARS ARE SPENT

The allocation and utilization of 402 funds is described in this chapter in terms of (1) cumulative trends for all program areas, (2) the degree to which 402 funds were concentrated in high payoff programs and, (3) States' use of incentive grants received for reducing fatality rates and the number of fatalities. The total highway safety program consists of an accumulation of individual State and local projects in each program area. The kinds of projects that are typically implemented have been summarized by each NHTSA Region to illustrate the diversity and qualitative aspects of highway safety activities involving 402 funding.

## Where the Money is Spent

As shown in Table III-1 the 402 funds can be traced to 19 major program/standard areas. These program areas with the exception of planning and administration are synonymous with the 18 Highway Safety Standards promulgated under the Act by the Department of Transportation. Also shown in the Table is the distribution of obligations among the program areas for two time periods -- FY 1967-74 and FY 1975-79. The comparison of these two periods allows an assessment of program change and maturity.

The distribution of funds in the FY 1967-74 period reflects the start-up aspect of many of the program areas. For example, the large obligations in traffic records went for the purchase of sophisticated data processing and recordkeeping equipment, while the obligations in driver education went for driver training equipment and devices, range facilities and other material (e.g., curricula, etc.) for the education program.

Large increases in many areas reflect the growing awareness of problems and countermeasure opportunities. Almost no funds were spent in motorcycle safety in the earlier period with almost $5 million obligated in the later period. In the early years, motorcycle safety was recognized as a potential problem, but effective solutions to the growing problem were not well understood -- with the exception of helmet usage. Current funding levels for motorcycle safety reflect growing concern about motorcycle involvement in accidents, better information about the causes of such accidents and the availability of solutions in the areas of traffic codes, rider education, licensing programs, and general public education programs. Large increases were noted in police traffic services and alcohol safety -- all areas identified as ones with large potential for crash reduction. A large increase in expenditures was also noted in school bus related activities but this increase was due to the Congressional decision to earmark funds under Section 406. Equally significant is the continued support to Emergency Medical Services to upgrade professional capabilities of Emergency Medical personnel and to purchase equipment. All of this effort was geared toward improving the total EMS system including communications subsystems.

Obligations for planning and administration of the program have significantly increased. This reflects the increased scope of leadership expected of the State Highway Safety Agency (SHSA). Governor's Representatives are expected to not only plan/manage the 402 program but to exert influence on the estab-

lished agencies in the State involved in highway safety to pull together and implement a coordinated program. Increases have also occurred due to NHTSA's guidance requiring more sophisticated data analysis, evaluation, and audit capabilities and due to the decisions in the States to hire data analysts and planning and evaluation specialists along with project managers.

The decline in 402 obligations for driver education, FY 1975-79, is a continuation of the decline noted in the FY 1969-74 402 assessment. This decline in percent of 402 dollars for driver education was offset by an increase in State funds for education purposes. In addition to a 100 percent increase in commercial driving school instructors, more public secondary schools are making more efficient use of existing mobile simulators and regional driving ranges. Also, we should note that because of the high cost of driver education, it has become a target for States in reducing their budgets.

**TABLE III-1**
**State and Community Highway Safety Program**
**Distribution of Section 402 Obligations**
**All Program Areas**
**(Millions)**

| FY 1967 thru FY 1974 | | | FY 1975 thru FY 1979 | |
|---|---|---|---|---|
| $ Obligation | % Total | Program Area* | $ Obligation | % Total |
| $ 37.713 | 8.0% | Planning and Administration | $ 93.807 | 12.0% |
| 5.153 | 1.1% | Motor Vehicle Inspection | 3.849 | 0.5% |
| 7.574 | 1.6% | Motor Vehicle Registration | 1.913 | 0.3% |
| 0.188 | -0- | Motorcycle Safety | 4.721 | 0.6% |
| 74.455 | 15.7% | Driver Education | 42.198 | 5.4% |
| 20.755 | 4.4% | Driver Licensing | 19.060 | 2.4% |
| 1.047 | 0.2% | Codes and Laws | 1.311 | 0.2% |
| 5.438 | 1.1% | Traffic Courts | 10.790 | 1.4% |
| 30.772 | 6.5% | Alcohol Safety | 63.098 | 8.1% |
| 19.895 | 4.2% | Accident Location** | 34.460 | 4.4% |
| 64.535 | 13.6% | Traffic Records | 31.679 | 4.0% |
| 56.367 | 11.9% | Emergency Medical Services | 85.849 | 11.0% |
| 8.863 | 1.9% | Highway Design** | 21.233 | 2.7% |
| 24.225 | 5.1% | Traffic Engineering** | 62.801 | 8.1% |
| 9.203 | 1.9% | Pedestrian Safety*** | 16.130 | 2.1% |
| 102.211 | 21.6% | Police Traffic Services | 254.939 | 32.7% |
| 3.353 | 0.7% | Debris Control | 5.294 | 0.7% |
| 1.355 | 0.3% | School Bus Safety (includes S.406) | 20.782 | 2.8% |
| 0.769 | 0.2% | Accident Investigation | 4.782 | 0.6% |
| $473.731 | 100.0% | Totals | $ 779.492 | 100.0% |

* All program areas except Planning and Administration are synonymous with Highway Safety Program Standards 1-18

** FHWA administered program standards -- FHWA obligations represent approximately 12 percent of each year's appropriation.

*** Jointly administered by NHTSA and FHWA.

Traffic records obligations have declined significantly during FY 1975-79 even though this function is considered very critical. The reason for this is that equipment purchases for integrated and readily accessible systems were done in the early periods and costs now are for software and analytical skills needed for data manipulation. The NHTSA has developed through Section 403 (Research and Development monies authorized under Title I) an analytical package -- Data Analysis Reporting Techniques (DART) -- to assist in this endeavor. Also presently each State is analyzing its data systems and earmarking priorities in its Highway Safety Plan.

Aside from the management function, two other areas show significant increases in FY 1975 to FY 1979 period: Alcohol and Police Traffic Services. This coincides with the Administration's Section 403 Alcohol Safety Action Projects which were demonstrations designed to highlight the drunk driving problem and to encourage State and local funds to be applied to this problem. Eighty-eight (88) million dollars were expended on these projects. We found that 12 of the 35 projects had statistically significant decreases in nighttime fatals, that the systems approach was successful, and that programs could be self sustaining through a fee system. We also found that, in the treatment area, educational programs were successful for social drinkers but not for problem drinkers. The increase in Police Traffic Services expenditures coincides with the increased emphasis on Alcohol and 55 MPH Enforcement along with the results from Section 403 demonstrations which showed Selective Traffic Enforcement Programs (STEPS) were effective and efficient means for police to deploy scarce resources and yet achieve measurable results.

As States improved their ability to deliver safety services, an increased share of 402 grants was shifted to pedestrian and motorcycle safety efforts. In turn, the proportion allocated to equipment purchases and to systems problems could be reduced. In most cases, State and local funds continued these support efforts, and freed 402 to attack new problems. A significant change occurred as States intensified these safety efforts. The quality of State management improved. The 402 program played a substantial leadership role, -- pioneer role -- as envisioned in the seed money concept.

## Comparative Analysis -- 402 Obligations FY 1974 vs. FY 1979

To facilitate development of a five-year assessment of Section 402 funding, eight program areas, in addition to planning and administration, will be discussed in depth. These program areas represent over 90 percent of all NHTSA 402 funds placed under obligation, and are most closely related to NHTSA's life saving objectives and countermeasures.

Table III-2 provides a comparison of FY 1974 and FY 1979 402 dollar distribution for the nine program areas, which represent 95 percent of obligations each year. For FY 1979, each program area shows a significant obligation growth over FY 1974, for an overall increase of $97.8 million, or 160 percent. The leading percentage increases are in pedestrian safety, school bus safety and police traffic services, with the latter program area consuming the lion's share of actual dollar increase due, primarily, to specific appropriations for high payoff enforcement activities described in the next section.

TABLE III-2
**Increase in Dollar Distribution of Fiscal Year 402 Obligations by Major Program Areas FY 1974 vs. FY 1979 (000's)**

| FY 1974 $ Obligation | % of Total | Program Area | FY 1979 $ Obligation | % Of Total | FY 1974-79 Increase % |
|---|---|---|---|---|---|
| $11,355 | 18.58 | Planning and Administration | $ 22,893 | 14.41 | +101.6% |
| 8,103 | 13.26 | Driver Education | 12,215 | 7.69 | + 50.8 |
| 2,386 | 3.91 | Driver Licensing | 2,973 | 1.87 | + 24.6 |
| 7,211 | 11.80 | Alcohol Safety | 14,021 | 8.82 | + 94.4 |
| 5,210 | 8.52 | Traffic Records | 8,794 | 5.54 | + 68.8 |
| 10,949 | 17.91 | Emergency Medical Services | 13,535 | 8.52 | + 23.6 |
| 712 | 1.17 | Pedestrian Safety | 3,617 | 2.28 | +408.0 |
| 14,191 | 23.22 | Police Traffic Services | 76,608 | 48.21 | +439.8 |
| 1,003 | 1.64 | School Bus (includes 406) | 4,236 | 2.66 | +322.4 |
| $61,120 | 100.00 | Totals | $158,892 | 100.00 | +160.0% |
| $64,005 | | Fiscal Year Obligation | $167,096 | | +161.1% |
| 95.2% | | % Fiscal Year Obligation | 95.1% | | |

## Obligation of High Payoff Funds

Beginning in FY 1976, Congress has appropriated a total of $128,660,000 to be programmed for the high payoff countermeasures such as selective enforcement, alcohol enforcement, NMSL-55 mph enforcement, and safety belt usage; as follows:

| | |
|---|---|
| FY 1976 -- | $ 16,230,000 |
| FY 1977 -- | 26,000,000 |
| FY 1978 -- | 43,000,000 |
| FY 1979 -- | 43,430,000 |
| | $128,660,000 |

During this time period FY 1976-1979 the States actually obligated a total of $155,863,000 to high payoff program areas. Table III-3 shows the obligation of 402 funds among the countermeasure areas; with selective enforcement subdivided into the three components of alcohol, regular and 55 mph. While alcohol, regular and 55 mph enforcement efforts are not mutually exclusive, they are generally conducted at different times and locations. For example, alcohol enforcement is carried out during nighttime hours on municipal and county roads, regular selective enforcement takes place at various times at high accident locations, and 55 mph enforcement occurs during daylight hours on sections of posted highways designed for high speed free-flow traffic.

The obligations reflect a continued high priority in key problem areas common among the States. Two areas that were not specifically highlighted in prior program years -- 55 mph enforcement and safety belt usage -- are now receiving a significant share of program funding. In FY 1979, the appropriation was specifically earmarked for NMSL-55 MPH enforcement ($40,000,000) and encouragement of safety belt usage ($3,430,000). 402 high payoff funds, obligated for 55 mph enforcement, increased annually from FY 1976 to FY 1979 representing 85 percent of high payoff funding in FY 1979 compared to 20 percent in FY

TABLE III-3
Obligation of 402 Funds for High
Payoff Countermeasures
FY 1976 thru FY 1979

| High Payoff Category | $ Obligated (Millions) | Percent of Total |
|---|---|---|
| Alcohol Countermeasures | $ 15.866 | 10.2% |
| Selective Enforcement | | |
| Alcohol | 5.364 | 3.4% |
| Regular | 53.872 | 34.6% |
| 55 MPH | 67.520 | 43.3% |
| Safety Belt Usage | 3.430 | 2.2% |
| Other High Payoff * | 9.811 | 6.3% |
| | $155.863 | 100.0% |

* **Includes program direction, pedestrian, motorcycle, traffic courts, traffic records post-licensing control and other program areas.**

1976 as shown in Table III-4. The designation of funds for countermeasure activity in these areas reflect the State and national consensus regarding the payoff potential for increased financial support for these activities. Between 1974 and 1977, State enforcement agency speeding arrests increased only 1.4 percent; but, between 1977 and 1979, speeding arrests increased 8.5 percent, due to 55 mph enforcement activity.

TABLE III-4
Distribution of 402 High Payoff Obligations
for Selective Enforcement by Fiscal Year
($ Millions)

| Fiscal Year | Alcohol Enforcement | Regular Selective Enforcement | NMSL 55 MPH Enforcement | Total $ Obligation | Percent of Total |
|---|---|---|---|---|---|
| 1976 | $0.757 | $ 8.298 | $ 2.271 | $ 11.326 | 9.0% |
| 1977 | 0.676 | 15.053 | 2.704 | 18.433 | 14.5% |
| 1978 | 3.492 | 23.391 | 19.914 | 46.797 | 36.9% |
| 1979 | 0.439 | 7.129 | 42.630 | 50.198 | 39.6% |
| Totals | $5.364 | $53.872 | $67.519 | $126.755 | 100.0% |
| % of Total | 4.2% | 42.5% | 53.3% | 100.0% | |

## Incentive Grant Funds

In addition to the regular 402 funds and the high payoff funds available to the States, Congress beginning in FY 1975 and continuing through FY 1978 made available a total of $56.0 million 402 funds as incentive grants to States showing significant improvements in reducing their mileage death rate and

traffic fatalities. Criteria, based on both decreased fatality rates and decreases in total fatalities over a four-year period, resulted in the following distribution of Incentive Grants to States:

- FY 1975 -- $13.0 million to 24 States for reducing mileage death rates during 1973.
- FY 1976 -- $13.0 million to 17 States for reducing mileage death rates during 1974.
- FY 1977 -- $15.0 million to 15 States for reducing mileage death rates and fatalities during 1975 (six States received awards in both categories).
- FY 1978 -- $15.0 million to 17 States for reducing mileage death rates and fatalities during 1976 (ten States received awards in both categories).

Recipient States were permitted to obligate the Incentive Grants to any highway safety related activity as long as adequate planning and project administration were ensured. An inspection of Table III-5 shows that the States concentrated their effort in the same key program areas as they had in their regular 402 program. The largest difference of consequence is in the planning and administration area with a lesser percentage of the incentive funds going into this area. In its Report to Congress in July 1977 the Administration recommended the discontinuation of Incentive Grants since the criteria used did not adequately measure accomplishments.

**TABLE III-5**
**Percent Distribution of Incentive Grant Funds**
**Compared to**
**Percent Distribution of Regular 402 Funds**
**by**
**Major Program Areas**
**FY 1975 thru FY 1979**
**(Millions)**

| Regular 402 | | | Incentive Grants | |
|---|---|---|---|---|
| $ Obligation | % Total | Program Area | *$ Obligation | % Total |
| $ 93.807 | 12.0% | Planning and Administration | $ 3.903 | 7.0% |
| 42.198 | 5.4% | Driver Education | 3.823 | 6.8% |
| 19.060 | 2.4% | Driver Licensing | 1.616 | 2.9% |
| 63.098 | 8.1% | Alcohol Safety | 3.666 | 6.5% |
| 31.679 | 4.0% | Traffic Records | 2.792 | 5.0% |
| 85.849 | 11.0% | Emergency Medical Services | 8.653 | 15.5% |
| 16.130 | 2.1% | Pedestrian Safety | 0.875 | 1.6% |
| 254.939 | 32.7% | Police Traffic Services | 19.150 | 34.2% |
| 20.783 | 2.7% | School Bus Safety | 0.202 | 0.4% |
| $627.543 | 90.4% | Totals | $ 44.680 | 80.0% |

* Included in Regular 402 obligations

## Project Activity in Major Problem Areas

In the following paragraphs we will discuss the quantity and nature of project activity generated by 402 funds in major problem areas. Not only do we look at obligations by program area (standard area), but we also have the capability to look at problem areas being addressed. Depending on the nature and extent of a problem, single or multi-program (standard) area countermeasures may have to be employed. For example, the extent of accident involvement of young drivers, problem drivers, drinking drivers, pedestrians and motorcyclists may call for the combined application of countermeasures in the areas of traffic laws and regulations, driver education, driver licensing, police traffic services, and traffic courts. Without effort in a variety of program areas, project activity is often incomplete and cannot be fully effective in addressing the problems which arise. Specific examples of project activities to address specific problems will follow this section to show the diversity and qualitative aspect of projects funded under the 402 program.

On April 1, 1979, the National Project Reporting System (NPRS) became operational for all States and territories. The purpose of this new system, which was initiated by NHTSA in 1978, is to establish a data bank of information on projects which are placed under agreement with subgrantees by each State Highway Safety Agency (SHSA).

In addition to cost data on each project, information is stored which identifies the grantee agency, jurisdiction, problem and program area(s), and planned project activities. For FY 1979, a total of 1,727 projects were filed in the system, each representing a 402 dollar cost of $20,000 or greater for a total of $159 million under agreement.

An analysis of the data indicated the following distribution of 402 dollars in FY 1979 at the project level:

- Project agreements executed with State agencies represent 714 projects, or 41 percent of total number of projects, for a total of $85.4 million, or 54 percent of total 402 funding. All major line departments in the States are included, such as Public Safety, Education, Health, Motor Vehicles, Transportation, Highway Patrol, Criminal Justice, and the State Highway Safety Agency.

- The remaining 1,013 project agreements, totaling $73.6 million, or 46 percent, of 402 funds, were executed with local jurisdictions of which 395 projects (23 percent) were with county or regional agencies and 618 projects (36 percent) were with municipal agencies.

Table III-6 provides a breakdown of 402 dollars under agreement for FY 1979 by problem area and project count. It should be noted that only seven problem areas account for 93 percent of 402 dollars obligated, and 90 percent of the total projects costing $20,000 or more. The majority of projects (37 percent) are related to selective enforcement activities addressing the problem areas of speeds in excess of 55 mph, other hazardous moving violations and drivers with poor performance records.

This Table clearly shows that the States are attacking five major problems: lack of adequate management, alcohol related crashes, high rates of noncom-

pliance with the 55 mph speed limit, other hazardous violations, and post accident response systems. These five problem areas represent 76.6 percent of the total dollars under agreement.

Program management and support, representing 23 percent of total projects, relates to problems, needs and/or deficiencies in program planning and administration, motor vehicle/driver regulatory controls, traffic records systems, and adjudication processes. The problem areas of alcohol, beginning drivers, and post-accident response combined to total another 27 percent of total projects under agreement which are directed toward reducing the incidence of accidents involving drinking drivers/pedestrians and inexperienced drivers, and providing adequate life-saving and clean-up response systems to the accident scene.

**TABLE III-6**
**402 Dollars Under Agreement**
**by Problem Area and Project Count**
**FY 1979**

| 402 $ Under Agreement (Millions) | Percent of Total | Problem Area | Number of Projects | Percent of Total |
|---|---|---|---|---|
| $ 42.55 | 26.8% | Program Management and support* | 391 | 22.6% |
| 29.90 | 18.8 | NMSL-55 MPH* | 204 | 11.8 |
| 16.09 | 10.1 | Alcohol* | 205 | 11.8 |
| 2.80 | 1.8 | Pedestrians | 55 | 3.2 |
| 1.25 | 0.8 | Motorcycles/Mopeds | 18 | 1.0 |
| 0.54 | 0.5 | Bicycles | 10 | 0.6 |
| 6.73 | 4.2 | Problem Drivers* | 91 | 5.3 |
| 6.89 | 4.3 | Beginning Drivers* | 117 | 6.8 |
| 4.17 | 2.6 | School Bus Safety | 60 | 3.5 |
| 32.99 | 20.7 | Other Hazardous Violations* (i.e., speeding, driving on the wrong side of the road) | 343 | 19.9 |
| 1.51 | 0.9 | Occupant Restraint | 21 | 1.2 |
| 12.73 | 8.0 | Post-Accident Response* | 199 | 11.5 |
| 0.27 | 0.2 | Vehicle Defects | 3 | 0.2 |
| 0.65 | 0.4 | Uniformity Standards | 10 | 0.6 |
| $159.07 | 100.0% | Totals | 1,727 | 100.0% |

* Problem areas totaling 92.9 percent of 402 dollars and 89.7 percent of total projects.

The NPRS also identified which cost categories each project falls under. While a given project may cover more than one cost category, Table III-7A illustrates, with reasonable accuracy, the major distribution of 402 dollars and projects by cost category. Over one-half of the 402 dollars and project activities are associated with the procurement of personnel services to manage, implement, and monitor projects. Training and educational materials and actual training of target personnel (police, judiciary, emergency medical technicians, etc.) accounted for an additional one-fourth of funds and projects.

Comparison of Tables III-7A and III-7B cost categories for FY 1979 and FY 1975 shows that personnel related costs increased as a percent of total from 35.2 percent to 55.4 percent and concurrently equipment/facilities related projects decreased from 21.9 percent to 15.0 percent. This trend shows a shift in emphasis from establishing a minimum level of highway safety activity to one of labor intensive solutions oriented projects involving project managers and overtime for police officers.

**TABLE III-7A**
**Distribution of 402 Dollars and Projects by Cost Category**
**FY 1979**

| 402 $ Under Agreement (Millions) | Percent of Total | Cost Category | Number of Projects | Percent of Total |
|---|---|---|---|---|
| $ 20.00 | 12.6% | Training Materials | 255 | 14.8% |
| 20.85 | 13.1% | Manpower Training | 198 | 11.5% |
| 88.17 | 55.4% | Personnel | 916 | 53.0% |
| 23.88 | 15.0% | Equipment/Facilities | 304 | 17.6% |
| 1.11 | 0.7% | Studies/Surveys | 15 | 0.9% |
| 3.65 | 2.3% | Administrative | 18 | 1.0% |
| 1.41 | 0.9% | All Other | 21 | 1.2% |
| $159.07 | 100.0% | Totals | 1,727 | 100.0% |

**TABLE III-7B**
**Distribution of 402 Dollars By Cost Category**
**FY 1975**

| 402 Dollars (millions) | Percent of Total | |
|---|---|---|
| $ 2.06 | 2.7 | Training Materials |
| 9.27 | 12.3 | Manpower Training |
| 26.87 | 35.7 | Personnel |
| 16.48 | 21.9 | Equipment/Facilities |
| 3.88 | 5.2 | Studies/Surveys |
| 4.39 | 5.8 | Administrative |
| 12.32 | 16.4 | All Other |
| $ 75.27 | 100 % | |

## State Activities in the 402 Programs

While the Highway Safety Standards remain the foundation for a State's highway safety program, the 1976 and 1978 Highway Safety Acts permitted the Secretary discretion in implementing these Standards and encouraged creative and innovative projects to solve problems. The Highway Safety Plan (HSP) is the grant delivery document used by the State to depict how they will deploy the 402

resources. The philosophy embodied in this document is that the Standard areas should be used as a means to address problems. Priorities are established by the States based on their problem analysis. This process still requires each State to maintain a certain base level effort in each standard area, but does allow for variations among States. During FY 1980 HSP approval, the Administration urged the States to concentrate on areas of uniformity such as: Rules of the Road, Driver Licensing, Traffic Records, and Motor Vehicle Registration and Titling. In addition, Alcohol, 55, Motorcycle Safety and Occupant Restraints were highlighted.

An excellent example of the comprehensive and detailed planning that occurs at the State level is found in the FY 1980 Highway Safety Plan submitted by Pennsylvania. Of special interest is a portion of the planned project activity in the alcohol area: Alcohol Highway Safety Program

**Problem Solution Plan No. 2** -- Commonwealth on Municipal Police Agencies

In order to accomplish the ultimate goals of extending the Alcohol Highway Safety Program across the Commonwealth, the following projects are necessary to achieve the desired results:

1. Establish 5 new D.U.I. programs to serve 7 counties where no programs exist. (Luzerne, Somerset/Bedford, Lackawana, Susquehanna/Wayne, Northhampton, Montgomery) $ 75,000

2. Bring D.U.I. Programs into compliance by developing and refining local program evaluation procedures. Utilize these procedures to monitor with site visits to each program in the Commonwealth on at least an annual basis, with additional monitoring visits where needed, and quarterly visits for the funded metropolitan program. Technical assistance visits to address identified problems will follow. $ 17,400

3. Develop supplemental programs in counties where special needs exist. Supplemental programs can include programs for: youth, women; elderly; and ethnic minorities. The goal for FY 1980 will be 5 supplemental programs. Target Counties: Lancaster; Bradford, Dauphin, Philadelphia; and Northumberland. $125,000

4. Maintain metropolitan program in Allegheny County through second year of its three year project period (11/78-10/81). In addition to funding, provide technical assistance as requested and intensive quarterly monitoring with site visits. $ 75,000

5. Develop interstate compact agreements with other States, beginning with States bordering on Pennsylvania. Compact agreements will expe-

dite interstate referrals and increase numbers of offenders brought into Alcohol Highway Safety System. Use contact with neighboring State authorities to address mutual concerns such as underage drivers crossing State lines to drink. $ 15,000

6. Increase knowledge and expertise of Alcohol Highway Safety Program staff through education and conference attendance. (Travel costs are included.) $ 4,300

7. Plan and structure Evaluation Project to evaluate effectiveness of Alcohol Highway Safety projects. Consult with Department of Transportation to determine appropriate areas to address. $ 3,000

## Typical State and Local Projects

The following paragraphs provide summaries of typical State and community project activities implemented over the past three (3) years in each of the ten (10) NHTSA Regions:

### Region I

- Trial Substitute Motor Vehicle Inspection -- **Connecticut**. Implemented in 1975, this program of random vehicle inspection has resulted in an overall upgrade in the safety quality of vehicles. In addition, it has provided data on type and frequency of defects.

  After inspecting more than 30,000 vehicles over a three-year period it was found that a sharp increase in the defect profile occurs after the sixth year of usage. It has been recommended that if a compulsory PMVI program is to be instituted, it should not involve inspecting all vehicles on a yearly basis, but should be a partial PMVI plan which exempts the newer vehicles.

- Bear in the Air -- **Maine**. This State Police aircraft enforcement surveillance operation has been in operation since 1975. It is considered a tremendous asset in their "55" selective enforcement program, as illustrated by the following results:

| Year | Aerial Citations | Citation Rate Per Hr. | % Exceeding 55 | (MPH) Avg. Speed |
|---|---|---|---|---|
| 1975 | 195 | 9.55 | 61.6 | 57.1 |
| 1976 | 136 | 6.67 | 70.0 | 58.5 |
| 1977 | 443 | 9.80 | 63.2 | 57.4 |
| 1978 | 911 | 14.96 | 51.2 (3/4 yr) | 55.6 (3/4 yr) |

- "55" Selective Enforcement -- **Massachusetts**. From January 1, 1978, to September 30, 1978, 55 teams issued 66,663 citations for exceeding Massachusetts speed law. Sixty-two percent of all speeding citations are issued by the 55 teams. On the 55 patrolled roads, accident rates have dropped 66 percent and injury accident rates have dropped 65 percent. These teams produced the greatest volume of apprehension of any patrol configuration observed in a recent 55 mph enforcement study. This State Police program tripled the conviction rate for moving violations on State highways.

- Alcohol Information for Teachers -- **New Hampshire**. This program presents seminars for high school teachers on alcohol use and abuse. Its purpose is to enable teachers to provide accurate alcohol information to their students.

  Thirty-five (35) instructors have been certified to teach pre-driver education students in a nine-week mini-course on alcohol and drug abuse. In 1979 five schools participated in the project. For FY-80 twenty schools plan to participate if 402 funds are available.

- Emergency Medical Services -- **Rhode Island**. During 1979, 180 hours of instructionby qualified physicians and nurses was given to 40 Emergency Medical Techncians assigned to ambulances, bring the State's total of trained EMT-As to over 200. In order to be certified as paramedics, the technicians were required to receive 100 hours of clinical instruction at the Rhode Island Hospital and 100 hours of advanced on-the-job training.

- Safety Belt Program for School Bus Passengers -- **Vermont**. The safety belt program is geared to children K-3. Twice a year children are instructed in the proper use of seat belts through the use of films, lectures and actual on-the-school bus experiences. Children are assigned to a specific seat in the bus for the school year. The program started in 1977.

## Region II

- Safety Belt Education -- **New Jersey**. Based on studies indicating 93 percent of vehicular occupants under age seven do not use safety belts, New Jersey developed a safety belt education program, now conducted in 52 hospital maternity wards where mothers of new borns are urged to utilize infant restraint devices. In addition, 402 funds are paying for increased safety belt education in the public schools and day-care centers the objective of these efforts is to save 250 lives each year and reduce the severity of crash injuries.

- Walking While Intoxicated Patrols -- **Puerto Rico**. A three-year analysis of traffic fatalities disclosed that 45 percent of total fatalities were pedestrians, and that 41 percent of fatal pedestrains autopsies showed positive blood alcohol content. In an effort to enforce a walking while intoxicated traffic law, special police

patrols were assigned to dangerous pedestrian exposure areas to remove problem drinker pedestrians and to warn those not observing safe walking rules.

- Pedestrian Safety for Retarded Children -- **New York City**. This educational program has helped mentally retarded children and adults achieve the independence to travel safely in city traffic. It consists of a 13 minute documentary film and companion pamphlet which describes travel training techniques for retardees. Seminars were held beginning in 1977 for parents, other relatives and teachers of the mentally retarded.

- **New Jersey's** alcohol countermeasures effort started with Federal 402 funding is now totally self-supporting. Every convicted drunk driver must go through an educational rehabilitation program (cost to the driver -- $30) before he can get his license back. One such center is located in each of 21 countries. The immediate objective is to reduce the recidivism rate of drunk driver offenses from a statewide average of 14 percent to approximately 2.5 percent. During FY 1980, a recidivism rate of less than three percent was experienced.

- The **New York State** Police have a "Controlled Access Highway Task Force" project extending over three years. It dedicates 150 uniformed troopers, supported by a structured supervisory staff on a full-time basis to enforce the 55 MPH on the interstate system and other controlled-access roads. The program incorporates different patrol strategies and is being subjected to close impact evaluation

## REGION III

- The **District of Columbia** has implemented a comprehensive alcohol/drunk driver enforcement program. It involves training, education, rehabilitation options, public information, client tracking and evalutaion. The program was implemented primarily as a result of adding an Alcohol Coordinator to the staff of the Traffic Safety Coordinator.

- **Maryland** State Police initiated a selective enforcement project, known as "Operation Yellow Jacket," directed at speed, specifically enforcing the 55 MPH national speed limit, and alcohol, i.e., the drunk driver. Selected high accident locations were patrolled by officers at appropriate times and traffic accidents were reportedly reduced by 38 percent.

- **Pennsylvania** Project Selection Criteria. -- In order to identify municipalities with the most severe traffic safety problems a unique computerized ranking system has been designed. The system is designed to rank all counties within the Commonwealth using parameters of total accidents, total road mileage, total population, accident severity and accident experience trend. Categorically selected localities can then be approached to initiate improvement programs with some degree of assurance that existing problems can be impacted by applying appropriate resources and countermeasures.

- **Pennsylvania** Pedestrian Project -- Pennsylvania has initiated an urban pedestrian project in ten municipalities where fatalities are high. Phase I involves a study in each locality to identify high accident locations, evaluate accidents by age groups, etc., review of local and State pedestrian laws, and recommend countermeasures. Phase II will implement countermeasures which includes changing local ordinances to promote safety pedestrian practices, public information programs, selective enforcement and engineering changes.

- **Virginia** has implemented a statewide alcohol program (VASAP) providing alternatives to defendants based on a fee system and partially supported by 402 funds. There are 24 projects currently covering about 80 percent of the State's population. The projects are a direct result of experience gained from the 403-funded Fairfax County ASAP.

- **Virginia** Child Restraint Use Project -- Public Information. "Mother Knows Best, Buckle Up" is the statewide public information program of the Virginia Association of Women Highway Safety Leaders to encourage Virginians to use approved safety restraints for child automobile passengers. The program marks the first time a Virginia Highway Safety project has been implemented entirely by volunteer women. It involves volunteers in each of the State's 135 political subdivisions.

## REGION IV

- 55 MPH Selective Enforcement Program -- **Alabama**. The State has identified specific segments of rural highways that are high accident areas and has used 402 funds to provide overtime patrol on these segments of roadways on peak days and times of day. An evaluation conducted by Auburn University reports that during 1977 and 1978, the application of 31,987 manhours of selective enforcement resulted in the prevention of 32 property damage crashes, 10 injuries and one fatality. Preliminary data for 1979 indicated that similar results can be anticipated in this continuing activity.

- Emergency Medical Services System -- **Florida**. Florida has 780 ambulances in operation with 99 percent meeting NHTSA specifications. Ambulances are so placed to allow an eight-minute response time to 82 percent of the population and a five-minute response to 50 percent. The statewide UHF communications network is complete in 60 to 67 counties covering 95 percent of the State's population. Twenty-five counties have working 911 systems, covering 47 percent of the population. Five more counties have systems on order which will bring total population coverage to 71 percent of the State.

- Local Selective Enforcement Program -- **Georgia**. During 1977 the City of Warner Robins recorded 1,134 accidents, 276 injuries and four fatalities. As a countermeasure, a Selective Traffic Enforcement Unit, consisting of six officers and three patrol cars equipped

with radar, was established. The beginning date of the project was June 1, 1978. During 1978 the city recorded 1,208 accidents, 248 injuries, and zero fatalities. Although traffic volumes increased 12.2 percent over 1977, accidents increased only 6.5 percent while injuries decreased 10.1 percent and no fatalities were recorded.

- Program Planning and Program Improvement -- **Kentucky**. The State had a standards oriented approach, lacked an organized plan for 55 mph, and lent little assistance to locals. In 1978 the SHSA contracted for the installation of a statistical package for problem identification and added two staff positions for analytical functions. The SHSA has objectives to improve timely liquidation of funds, has established preliminary project negotiation procedures, and has established 55 mph program objectives. As a result of these efforts, the FY 1980 HSP is significantly improved in problem identification, with evidence of sound negotiations with prospective grant recipients. In the 55 mph program, during FY 1979 the SHSA provided two speed detection devices for all State police vehicles, and beginning in September 55 mph efforts will involve 70,000 overtime hours for 550 State police officers. Through problem identification the SHSA has developed STEP programs for local communities in 80 percent of high accident counties.

- Police Resource Allocation -- **North Carolina**. The City of Greensboro, with the support of 402 funds, conducted various traffic law enforcement experiments over a three-year period to determine how best to utilize limited resources for accident prevention. It was determined that the assignment of two units for a two-week period, one hour per day, at a high accident location was the most cost effective enforcement configuration. It was found that with this configuration, hazardous moving violations would remain below preenforcement levels for at least 11 weeks following the two-week enforcement effort.

  As a result of this project, the City is currently using this enforcement configuration at 100 identified high accident locations. After a sufficient period of operation, a further evaluation will be conducted to determine the impact of this expanded effort on the crash rate.

- Alcohol Safety Action Programs -- **South Carolina**. As a result of the ASAP Demonstration Project in Columbia, the State used 402 funds to expand the ASAP concept into all 46 counties. During the period of Federal funding, DWI schools were established, training programs were conducted for 123 instructors, and 28 counseling and referral officers were added to the courts. In-service training was also conducted for magistrates and police.

  As a result of this effort, the South Carolina legislature authorized a tax on the alcoholic beverages which generates over $2,000,000 per year to provide for the continuation of these programs.

- Mobile Alcohol Testing -- **Tennessee**. DWI arrests for Metropolitan Nashville have increased from an average of 76 per month in 1971

to over 800 per month in 1978. A six-man motorcycle squad supported through 402 funds has accounted for over 20 percent of the total DWI arrests.

At this time, approximately 95 percent of the DWI charges being made in Nashville-Davidson County are resulting in convictions. Adjudication of DWI charges is completed anywhere from one day to six weeks after the charge is made, with the average adjudication process being accomplished in three weeks

- Child Restraint -- **Tennessee**. Of worthly note is the fact that Tennessee is the only State in the nation with a Child Restraint Law. Section 402 funds are being used both for public information and education, and enforcement of this law. As of May 1979 usage rates have increased from 9 percent to 17 percent.

## REGION V

- Emergency Medical Services Program -- **Illinois**. At all levels of trauma centers, training programs were established for patient care delivery personnel. Over 800 personnel were graduated and certified through the National Registry with Illinois leading the nation in training and certification of emergency medical technicians-ambulance (EMT-A). During this same year over 12,000 patients were admitted through the trauma center complex. Twenty hospital radios were procured and installed.

- Selective Enforcement For Accident Reduction (SEFAR) -- **Indiana**. SEFAR was designed to combat the fatal accident problem in the 17 highest accident locations in the State. Utilizing selective enforcement techniques, the program concentrated on the specific time of day, day of week, and the month during which the highest frequency of accidents occurred. Emphasis were placed on the causation violation most often appearing on the accident reports.

- Accident Location Index -- **Michigan**. This index is being developed as an advanced computer process to provide prompt and accurate traffic accident information on every mile of roadway within the State. Individually or collectively the system will provide the exact location where initial vehicle impact occurs in traffic crashes. Monthly lists and complete analysis of crash location will be provided to all local governments for use by traffic engineers, enforcement personnel and all other users of traffic crash data.

- Child Restraint Program -- **Michigan**. Michigan is attempting to increase occupant restraint usage through a multifaceted program. This program includes an infant restraint program, a local government and industry program, a primary/secondary education program and a mandatory State employee restraint usage program. Materials and technical assistance are provided free or at cost. Since the inception of the program, League General Insurance Company has provided a free child restraint device for each new child of a policy holder. Eighteen hospitals currently have some type of

child restraint program for new mothers and the Michigan Department of Labor's Occupational Health and Safety Division include occupant restraint education in their occupational safety instruction.

- Driver Education Emergency Driving Program -- **Minnesota**. This project is to provide a facility capable of teaching various emergency driving skills under real environmental and speed conditions. Special training for ambulance, police and fire vehicle operators is designed to develop their skills in (1) controlled braking; (2) evasive techniques; (3) spatial relationships; (4) off-road recovery techniques; (5) vehicle skid control; and (6) vehicle control during blowout. The facility will also be used for driver education teachers and student training.

- Alcohol Countermeasure Site Development -- **Ohio**. This project's objective was to reduce the recidivism rate of DWI offenders by temporarily removing them from peer group pressure and at the same time placing them in an environment where they are forced to take an in-depth look at what alcohol has done to them and to face the problem.

  Essential ingredients of the program are: three day incarceration at an alternative location, usually a dormatory; education seminar, to eliminate commonly held myths about alcohol; and personal introspection through group/individual counseling. This program is self-supporting with fees paid by the offender, unless indigent.

- Police and Emergency Medical Services Communications System --**Wisconsin**. The project planned, procured and strategically placed 14 VHF base transmitters controlled by six control centers located at the State Patrol District headquarters. A microwave relay system was installed across the State with 26 radio relays that allow cross communication between all enforcement, emergency response and designated emergency hospitals.

## REGION VI

- Driving While Intoxicated (DWI) Treatment Program -- **Arkansas**. Six services are provided by the mental health centers: Pre-sentence investigation and problem drinker diagnostic screening for the courts; DWI school, corrective education for first offenders and social drinkers; therapy and treatment for offenders at secondary and lower levels of problem drinking; and follow up of cases processed through therapy.

- National Emergency Assistance Radio Plan (Project NEAR) -- **Louisiana**. With the advent of large scale usage of the CB and the development of the NEAR planning manual by NHTSA, it was decided that Project NEAR had potential for solving the rural communications problem. A plan has been developed for implementation of a statewide NEAR program. The State has been divided into three sections and the project will be implemented in three phases over a three year period with location priorities for implementation being set from accident experience.

- Pedestrian Safety Project -- **New Mexico**. The New Mexico Traffic Safety Bureau sponsored a project whereby a van, staffed and operated by three State Police officers, was used to pick up under "protective custody" those pedestrians using the highway and exhibiting the potential for possible physical harm, most often as a result of inebriation.

- Fixed Wing Aircraft Enforcement of 55 MPH -- **Oklahoma**. The Oklahoma Highway Safety Program Office and the Oklahoma Department of Public Safety initiated a 55 MPH enforcement project using fixed wing aircraft with ground support vehicles in fiscal year 1976. The project actually was intended to reduce the average speed on I-40 from Oklahoma City east toward Arkansas State line from 65 MPH to 62 MPH. Currently the average speed is 61.4 MPH.

- Oklahoma City Alcohol Safety Project -- **Oklahoma**. This project was funded as a continuation of the 403 Demonstration. As 403 operational funding phased out, the City of Oklahoma and Oklahoma Highway Safety Program Office provided the resources to maintain all operational aspects (enforcement, prosecution, probation and judicial) at full performance.

- Municipal Court Procedures Manual -- **Texas**. The Texas Office of Traffic Safety (OTS) was instrumental in the development of a Municipal Court Procedures Manual for judges and clerks. Although municipal courts were authorized by Texas Constitution there was no single agency or focal point to provide technical assistance, judicial training programs or to develop uniform policies and procedures for their operation.

  The completed manual contained the best legal thinking for policy and procedures for operation of municipal courts. Also, the manual listed marginal references to the Texas Code of Criminal Procedure, the Penal Code, as well as landmark cases that provide guidance in such cases. The manual has been widely accepted and comprehensive enough to be called a "How To" book that can be used to establish and operate a municipal court in any Texas city.

## REGION VII

- Accident Investigation Demonstration Project -- **Kansas**. The Wichita Police Department and Kansas Highway Safety officials established the Police Traffic Services/Accident Investigation Demonstration Project. The program involved the employment of 16 para-professional (non-commissioned) accident investigators, one records clerk, one professional supervisor, plus the procurement of four specially designed vans, ten police cars and additional supporting equipment. The project has reoriented the Police Department into a more traffic safety responsive organization.

- E.A.R.S. (Emergency Assistance Radio System) -- **Iowa**. The Emergency Assistance Radio System (EARS) was initiated to minimize abuses of CB radio transmissions and maximize meaningful CB effectiveness.

EARS is a volunteer group of CB radio enthusiasts organized to improve the "eyes and ears" of the State Patrol and provide immediate assistance in emergencies.

- State PMVI and School Bus Inspection Program -- **Missouri**. Under the Uniform Training Program for Inspector/Mechanics, approximately 3,200 inspector/mechanics are trained annually at the nine Troop Headquarters. In 1974 they were experiencing a 43 percent failure rate. A more interesting and informative format was developed to improve comprehension and improve the quality of the program. Program inspectors were trained and utilized to perform on-site periodic checking and revalidation.

  To expedite the above effort and to facilitate a legislatively mandated annual school bus inspection program, 12 inspection/training vans were purchased and suitably equipped. (School buses now get two inspections each year, one at an approved inspection station and the other by the Highway Patrol.)

- Rural Selective Traffic Enforcement Program (R-STEP) -- **Nebraska**. The selective enforcement project originally assigned additional officers to the Sheriffs in six rural counties in which there was a high rate of traffic accidents (U.S. Route 30). This was the first time Sheriffs were ever involved in traffic enforcement in Nebraska. Deputies were hired, equipped, trained and deployed to high accident locations at selected times. The project's aim was to reduce fatalities by five percent in the designated areas and to increase hazardous moving violation citiations.

## REGION VIII

- Denver Pedestrian Safety Project -- **Colorado**. This project was designed to reduce crashes, deaths and injuries involving pedestrians by ten percent in Denver from the expected rates in target communities. The Denver Police reviewed and analyzed 2,500 pedestrian-auto crashes occurring over a five-year period in order to develop the following programs. A public information, education, enforcement, pedestrian violator school and necessary traffic engineering modifications to improve pedestrian safety were implemented in the City.

  Preliminary results appear to be very encouraging. The project is being contined with city funds and the evaluation of this project will be continued through 1981.

- Restraint Systems -- **Montana**. In an attempt to increase public awareness and point out the advantages of restraint systems usage in automobiles, the Tri-County Health Department had a full-time nurse conduct presentations on health-related activities to various civic organizations. She was provided with handout materials and information on the advantages of the use of child restraint systems. By reading available literature and purchasing certain seats in conjunction with her presentations she was able to convey a substantial amount of information to new parents on child restraint systems on a one-to-one basis.

- Emergency Medical Services Program -- **North Dakota**. The purpose of this project was to increase the numbers of EMT certifications and to lower the average ambulance response time statewide to 30 minutes for at least 75 percent of the traffic accident victims. Also, this project trained additional personnel to man the new strategically placed ambulances aimed at lowering the response time in needed areas. Response time was lowered to 22.1 minutes average for 100 percent of the victims. Also, an additional 1,079 Emergency Cardiac Technicians and 826 EMTs were trained and registered.

- Alcohol and Drinking Film -- **South Dakota**. An alcohol and driving demonstration was conducted to illustrate the effects of different levels of alcohol on men and women drivers. A film called "High Driving" was produced during the demonstration. Over 100,000 persons viewed the film on prime time television. The purpose of the film was to inform the South Dakota driving public of the dangers of mixing alcohol and driving.

- Alcohol Safety and Young Drivers -- **Utah**. This project was funded to provide a teenage alcohol education school in Salt Lake County and to reduce the alcohol offense rearrest rates of the teens attending the school sequence. Throughout the project period, 123 court referrals of teens and their parents were made and they received educational treatment as part of the program.

- Pedestrian Safety Project -- **Utah**. This project was funded to develop an effective pedestrian safety awareness program in each of the ten elementary schools within Sandy City. The program centered around a mobile safety town concept after developing a teaching curriculum to be used with the Safety City that was targeted for pre-school, K-3, and 4-6. Also, a community awareness program was conducted that directly supplemented and promoted the Safety City program. A roster with accident data on all participants completing the Safety City program was kept. The purpose of the project was to reduce auto-pedestrian accidents by ten percent during the 1977-78 school year as compared to the 1974-76 baseline years.

  Over 6,000 students completed the Safety City program. Each student participated in approximately three hours of classroom instruction in the practical skills development portion of the program. Also, each student actively played the role of both the pedestrian and the driver during class instruction.

- 55 MPH Patrol Enforcement -- **Wyoming**. During 1977 Wyoming had the highest percentage of drivers exceeding the 55 mph speed limit --77 percent. The purpose of this expanded project was to increase arrest citations and lower the percentage of drivers exceeding the speed limit. Wyoming purchased 100 new "speed-gun-sights" which equipped all of their patrol cars with radar. Additionally, two planes were rented for air-ground use. Two additional part-time clerks were hired to process the increased number of citations. For the last quarter of FY 1979, the number of drivers exceeding the 55 limit was less than 70 percent.

- An incentive to create urban special traffic bureaus -- **Arizona**. Through the encouragement of the Office of Highway Safety, the Mesa Police Department developed a project to purchase nine motorcycles and hand held radar units. This project provided the "carrot" needed to cause the city to agree to create a traffic bureau in the States' third largest city. It also has established a significant technique by which other cities can be encouraged to create special traffic divisions or bureaus.

- Marijuana Impairment -- **California**. The California Department of Justice conducted a 402-funded project to determine the incidence of marijuana in driver impairment by analyzing some 2,400 blood samples from drivers already determined to be "impaired" by police observation and apprehension. The marijuana impairment level of the obviously impaired drivers averaged 16 percent, with many of these drivers having relatively small levels of alcohol. A follow-up three year blood-marijuana/driving forensic program is now being planned by the California Justice Department. This new program includes a training module for law enforcement personnel in proper roadside screening and blood sample procedures as well as the establishment of a statewide blood-marijuana assay service. In addition, measured impairment levels will be supported with tests of simulated and actual driving by subjects after ingestion of known levels of marijuana. This will indicate special training efforts for traffic law enforcement personnel and will serve as a basis for detecting marijuana-impaired drivers. This project has, of course, nationwide implications and the results should be closely followed at the State and national levels.

- Bicycle Safety Program -- **California**. The University of California at Santa Barbara developed a comprehensive countywide bicycle safety program including adoption of the county licensing ordinance, training of county agencies to license bikes and disseminate safety information, implementation of a selective enforcement program, the design and use of a bicycle accident reporting form, a study of bike crashes, and the computerized storage and analysis of all data collected. This project has nationwide interest.

- Integration of the county traffic records systems -- **Hawaii**. Because of the unique structure of Government in Hawaii where most of what are normally State functions are vested in the four island-counties, it has been very difficult to integrate the county level traffic records systems. This project will serve to integrate the major island-county driver licensing sub-systems to provide timely information to driver licensing agenices, the police and traffic courts, as well as to tie in, on-line, with the National Driver Register system.

- Alcohol Safety Coordination -- **Alaska**. Alaska's most significant project provided a position, with clerical support, to coordinate the development of several independent alcohol countermeasures and highway safety programs in different geographic locations of the State. A program was initiated to integrate actions of law enforcement, prosecution, adjudication, corrections, alcoholism/alcohol abuse treatment and prevention programs.

  Anchorage adopted an ordinance that essentially made it illegal for a driver with a blood alcohol concentration greater than .10 percent to operate a motor vehicle. An administrative change also allows for the obtaining of an involuntary blood sample in a medical setting from drivers arrested for drunk driving who refused the breathalizer test. With support from 402 funds the Anchorage Police Department engaged in a demonstration selective enforcement program directed at drunk drivers. 402 funds supported the establishment of a court support service and liaison between the courts and community services with regard to the use of alternative sentences for persons convicted of drunk driving.

- Railroad Near-Miss Program -- **Idaho**. Union Pacific Railroad train crews record and report near-miss incidents along their route as a matter of routine in Idaho. In Cassia and Minidoka Counties, the Union Pacific radio reports are relayed from the train crews to the Union Pacific Center in Pocatello to the appropriate sheriff's office. The near-miss reports have become one of the solution programs to reduce car-train accidents in a high accident region of the State. Offenders are promptly contacted by the sheriff's office and reprimanded or cited. Most R/R crossing violators are local residents, and the publicity from this program makes clear to them that they are being observed by the front end crews and can be reported for grade crossing violations.

- Crash Injury Management Course for Local Agency Police Officers -- **Oregon**. Oregon has taken the position that every enforcement officer should be formally trained to render emergency medical assistance at the scene of traffic crashes.

  The Board on Police Standards and Training through a grant from the Oregon Traffic Safety Commission utilized the 40 hour DOT Crash Injury Management Program as a countermeasure. The grant is now in the third phase and since the beginning there have been over 2,000 local police officers trained in the CIM course. Under another task, the Oregon State Police have all received the 40 hour CIM course. In FY 1979 the CIM Course was enlarged to include training of the State's Highway Division road crews and volunteer personnel with local fire and rescue units who act as first responding units.

- Model Local Traffic Records System -- **Washington**. The Office of Traffic Records Programs was created in Washington State to provide guidance for the orderly development of effective Traffic Records Systems at both the State and local level. After a feasibility

study, which proved the practicality of developing systems that would satisfy local needs and still comply with Federal standards, the SHSA began the development of two Traffic Records "cook books." These "cook books" were the conceptual design of State and local traffic records systems. Thirty-six jurisdictions are currently participating with fifteen additional jurisdictions to enter the project in FY 1980.

# CHAPTER IV

## THE EFFECTIVENESS OF THE STATE AND COMMUNITY PROGRAM ON FATAL AND INJURY ACCIDENT REDUCTION

As with any Federal assistance effort, it is important to determine the extent to which the recipient of funds is meeting its ultimate objective. The objective of the State and Community program is to reduce death and injury on the Nation's highways. Preceding chapters have presented considerable evidence that the 402 program has succeeded in influencing State expenditures for safety and has assisted the States in improving the quality of their programs. The next step must be to demonstrate that the 402 program has resulted in a reduction of crashes on our Nation's highways. This chapter reviews the available evidence of crash reduction and describes efforts underway to augment these findings with additional information.

### Problems in Measuring Crash Reduction Effectiveness

The difficulties involved in measuring the accident reduction effectiveness of a highway safety program are well known. In contrast to safety measures which reduce or prevent injury when a crash occurs (such as passive restraints, collapsible steering columns, padded dashes, breakaway sign posts and guardrails which prevent a vehicle from leaving the roadway), the benefits of safety programs designed to act in the "pre-crash phase" and prevent accidents are difficult to determine.

When a crash occurs it is possible to reconstruct the physical forces to determine what objects produced damage to the car or injury to the occupant. When evaluating accident prevention programs we are dealing with crashes which did not occur. To determine whether the program of interest contributed to this nonevent requires inference from other data. Such inferences may be difficult to support and are always subject to challenge.

Highway accidents almost always result from a number of factors. Consider the car driven by a drunk driver late on a rainy night that fails to negotiate a sharp turn, skids off the road into a tree. In this simple accident, we can note at least five factors -- alcohol, darkness, wet pavement, sharp curve, tree by roadside -- which contributed to the crash. Had any of these factors not been present, the accident might have been avoided. Since most safety programs deal with only one of the many factors which produce accidents, the process of inference by which the effectiveness of the measure is determined must not only establish a relationship between the particular program and any crash reductions observed, but must also eliminate the possibility that any of the many other crash causation factors could have produced this change.

The requirement to eliminate the potential alternative explanations for an observed reduction in crashes places a heavy burden on the evaluator. Typically, a "control" site is used to show that the changes which occur in the community with the safety program did not occur in a like community without the program. Unfortunately, few communities are similar enough to provide persuasive evidence that all other factors, but the safety program in question,

are the same. Failing a control area, the evaluator must laboriously demonstrate that all reasonable alternative explanations for the reduction could not have caused the particular change in accidents observed following the implementation of the new safety program.

This process of providing scientific proof that a safety measure has prevented accidents is costly, time consuming, risky, and subject to error. It is costly because it requires highly trained personnel and considerable expense in data collection, storage, and analysis. It is time consuming because it is necessary to collect accident records over an extended period of time in order to have enough data to show the effects of a safety measure. It is risky because unexpected factors, such as a fuel crisis or a plant closing, can significantly change traffic patterns and obscure the effects of a safety program. Finally, it is subject to error since the benefits of a particular program may be significant but too small to show up as a statistically significant reduction in crashes given all the other factors which affect accidents.

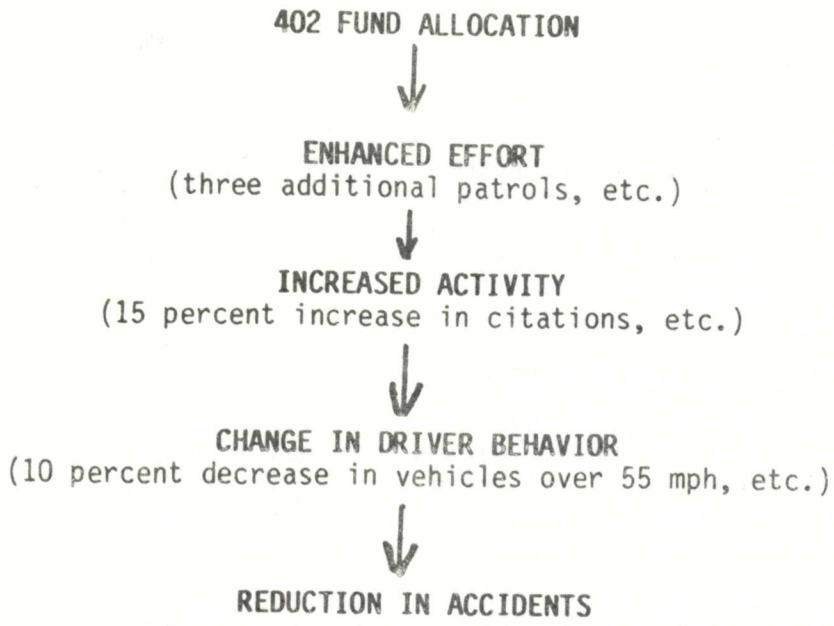
In view of these difficulties, it is not surprising that few well controlled experimental validations of traffic safety programs have been conducted. Most claims for effectiveness are based simply on an observed short-term reduction in the type of crash which the safety measure was designed to reduce. This short-cut to evaluation is particularly likely to be misleading because of the natural tendency to report only positive results, with all the occasions on which the same remedy was tried without effect going unreported.

The problem for the States in evaluating 402 projects is exacerbated by the fact that this program is designed to leverage the much larger State safety expenditures. Therefore, the individual grants are rarely designed to produce an impact in and of themselves, but rather act as a part of a larger program. It is frequently impossible to evaluate the particular unit which is supported by 402 funds in terms of its impact on accidents. Thus, the benefits of the project must be measured in terms of the increased efficiency or effectiveness of a much larger unit or organization. This exposes the project to factors beyond its control. For example, the two patrol units added to the city police force may be very effective in apprehending drunk drivers, but if in the mean time, four or five of the city's hundred other police patrols are diverted to some new high-priority activity by unexpected circumstances, the overall effect may be zero.

Despite such problems, evidence of effectiveness is accumulating and it is expected that the new management system being employed by NHTSA in administering the 402 program will result in additional evaluation studies in the future. To produce the State Highway Safety Plan, which is required for release of the grant funds, the State must identify its safety problems, select and implement safety programs, and evaluate the impact of those programs on accidents. This new emphasis on evaluation, as part of the planning process, should increase the resources given to determining the effectiveness of 402 projects.

Effectiveness studies may encompass a number of measures which touch different points of the program process diagrammed in Figure IV-1:

FIGURE IV-1
Typical "Chain of Action" For Safety Programs




The greatest interest, of course, is in the evaluation of the reduction in accidents. However, evaluations which demonstrate changes in driver behavior can be important where that behavior (such as motorcycle helmet use or number of vehicles exceeding the speed limit) can be related to injury severity or crash causation. Of least value are evaluations which indicate only the increase in activity. It is generally difficult to directly relate such increases to accident reduction.

Aside from the type of criterion data provided in an evaluation report, the quality of the research design is important to the confidence which can be placed in the conclusions given. A scientific evaluation of effectiveness requires a good research plan which demonstrates that the many other factors which could influence accidents do not account for any reductions attributed to the safety effort. Only a few State reports at this time provide acceptable scientific evaluations of accident reduction effectiveness.

## Evidence of Impact

The reports summarized in this chapter include both level two (Driver Behavior) and level three (Crash Reduction) studies, and include reports which are based on only a minimum of analysis along with those of relatively elaborate research designs and statistical treatments. These discussions cover projects in which the 402 program played a significant role, but the financing was primarily from the State. Since the basic goal of the 402 program is to produce a reduction in accidents by influencing and assisting State efforts rather than operating alone, 402 effectiveness can best be gauged by the impact of the State's overall highway safety program.

In order to provide background for interpreting the studies made in individual program areas, a brief discussion is made of recent national fatality and exposure trends in highway safety. The reports of national studies and State studies are then summarized for the following program areas, along with the general conclusions reached:

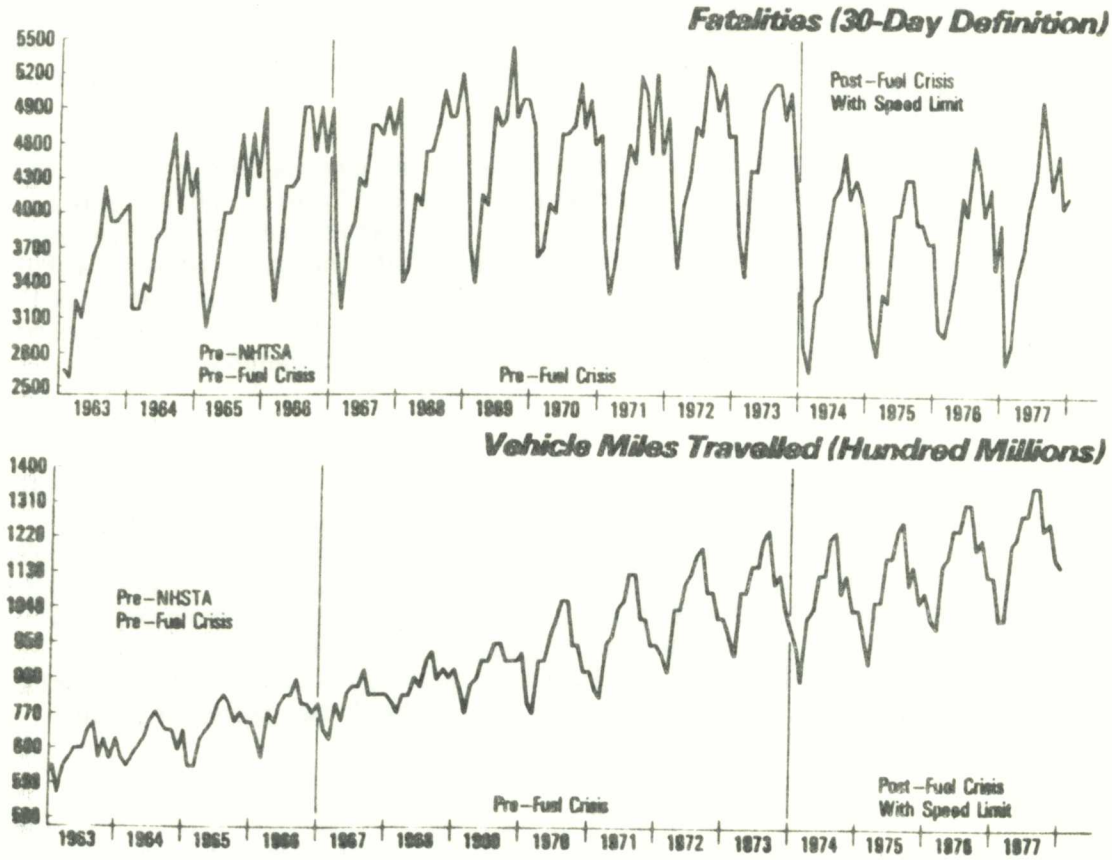
-- 55 MPH Speed Limit
-- Motorcycle Helmet Usage Laws
-- Alcohol in Relation to Highway Safety
-- Selective Traffic Enforcement Programs (STEP)
-- Emergency Medical Services (EMS)
-- Pedestrian and Bicycle Safety
-- Pupil Transportation Safety
-- Driver Education
-- Periodic Motor Vehicle Inspection

## National Fatality and Exposure Trends

The attempts to evaluate individual State safety projects must be viewed against the background of recent national trends in highway safety. Figure IV-2 provides an overview of the trend in vehicle miles traveled and resultant fatalities over the last 15 years. Vehicle miles of travel provide the best continuing quantification of exposure of the American public to highway crashes.

The lower graph indicates vehicle miles increased steadily over this period of time. A slight decrease did occur during the 1973-1974 fuel crisis. By late 1975, vehicle travel was on the rise at the old rate once again.

FIGURE IV-2



It is clear that highway fatalities have not followed this upward trend in exposure. From 1963 to 1967 fatalities rose steadily. In addition to the previous month's fatality count being reached, an additional 248 fatalities were occurring each month. However, beginning in 1967, fatalities began to level off as the monthly increase dropped to 20 deaths. This trend remained level until the advent of the fuel crisis. In 1974 and 1975 there was a precipitous drop in fatalities -- a decline much larger than the small reduction in vehicle miles traveled. Since 1975 there has been a slow rise in fatalities which, if not reversed, will bring us back to the 1967-1973 level within two to three years.

The factors which resulted in the first change in the fatality trend in 1967 are difficult to pinpoint. The National Highway Traffic Safety Administration was established in 1966, and the programs under the Highway Safety and Motor Vehicle Safety Acts were initiated during this period with a number of key improvements in vehicle crash safety appearing in 1968 models. In addition, the construction of the Interstate System was over 58 percent complete by 1966, resulting in a large portion of the total vehicle miles being traveled on a system with significant safety design features. Aside from these Federal-State safety programs, the numbers of fatalities may also have been influenced by economic conditions and other unknown safety factors. Nonetheless, it is noteworthy that a significant long term change in fatality trend coincided with a marked increase in Federal highway safety activity.

The factors related to the second change are easier to identify. The drop occurred during the period of fuel crisis from September 1973 to March 1974. Much of this drop appeared to be due to the difficulty in obtaining gasoline, the rising price of fuel, and the publicity given the need for conservation. Following this period, however, while vehicle miles travel returned to pre-crisis levels, traffic fatalities remained low. At least half of this reduction has been identified by NHTSA and FHWA research as due to the 55 mph speed limit. Because of the apparent effectiveness of this law, a major portion of the 402 funds have been used in this area.

With respect to the data on 402 program impact which follow, this background suggests that:

1. There is evidence from national trends that highway safety has been improved during the lifetime of the 402 program.
2. There are several complementary safety programs which have contributed to this improvement, among them the Motor Vehicle Safety Act and the Interstate Construction program. The overall contribution of the 402 program has not been separately identified.
3. The 402 program has made a significant contribution to enforcement of the 55 mph speed limit. A substantial reduction in fatalities has been attributed to the speed limit.
4. It is clear that highway safety can be affected in a significant manner by such historical events as the fuel crisis of 1973-1974. Therefore, project evaluations which occurred during this period or a later fuel crisis, such as the spring of 1979, are likely to be biased or invalidated by such events unless the research design controls for the effect of the fuel crisis.

## 55 MPH Speed Limit

In the late fall of 1973, in response to the fuel crisis produced by the OPEC embargo of oil supplies, the Federal Government called on the States to pass 55 mph maximum speed limit laws as a fuel conservation measure. While initially instituted as a fuel economy measure, experience soon indicated that it also provided a major safety benefit as can be seen from Figure IV-2. The national fatalities declined, initially due to reduced driving, but as the reduction continued into 1975 and 1976, it became clear that the speed limit was having an effect well beyond the effect of the fuel crisis. At the beginning, much of the reduction in observed speed resulted from the national public response to the crisis itself and perhaps the rising cost of fuel. As the crisis subsided, it became more clear that if the conservation and safety benefits were to be retained, enforcement of the limit would have to be stepped up.

The burden of this increased enforcement fell upon State and local police forces at a time when their resources were severely limited by Government economy moves. In this situation, NHTSA made the 402 program an important source of support for 55 mph enforcement. This program was designated a "high payoff area" and special 402 funds were made available as described in Chapter III. Since 1975 the 55 mph law has been a major priority of the 402 program and these funds have been used to encourage State and local police enforcement activities.

An analysis of Federal Highway Administration speed statistics reported by States from 1975-79 are summarized in Table IV-1 for rural interstate highways, over which the State enforcement agencies have jurisdiction:

**TABLE IV-1**
**Annual Free-Flowing Speed Summaries**
**Rural Interstate Highways**

| | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|
| Average Speed (MPH) | 57.6 | 58.2 | 58.8 | 58.8 | 58.0 |
| 85th Percentile Speed (MPH) | 60.8 | 61.8 | 63.7 | 63.7 | 62.7 |
| Percent of Vehicles Exceeding: | | | | | |
| 55 MPH | 68 | 69 | 74 | 74 | 69 |
| 60 MPH | 27 | 32 | 35 | 35 | 29 |
| 65 MPH | 7 | 10 | 10 | 10 | 8 |

The data indicate a steady rise in average and 85th percentile speeds, as well as in the percent of vehicles exceeding 55, 60 and 65 mph, from 1975 through 1978. In 1979, however, all speed categories declined, closely approaching the 1975 levels. The earmarking of 402 funds for 55 mph compliance in FY 1979, and the establishment of mandatory sanctions for noncompliance to 23 U.S.C. 154(f) criteria, were factors in stimulating 55 mph enforcement efforts in 1979 and may have contributed to this result.

The nationwide imposition of 55 mph laws permitted a number of scientific investigations of the accident and injury severity reduction benefits of these laws. Several of these are summarized.

Texas

In Texas the speed limit law was enacted in January 1974 and enforcement activity was immediately increased as indicated by the doubling of arrests (see Figure IV-3). Fatal accidents on high speed roadways effected by the 55 mph law declined during the fuel crisis and remained well below their former level after the crisis passed (see Figure IV-4).

FIGURE IV-3
Speeding Citations by Texas Highway Patrol

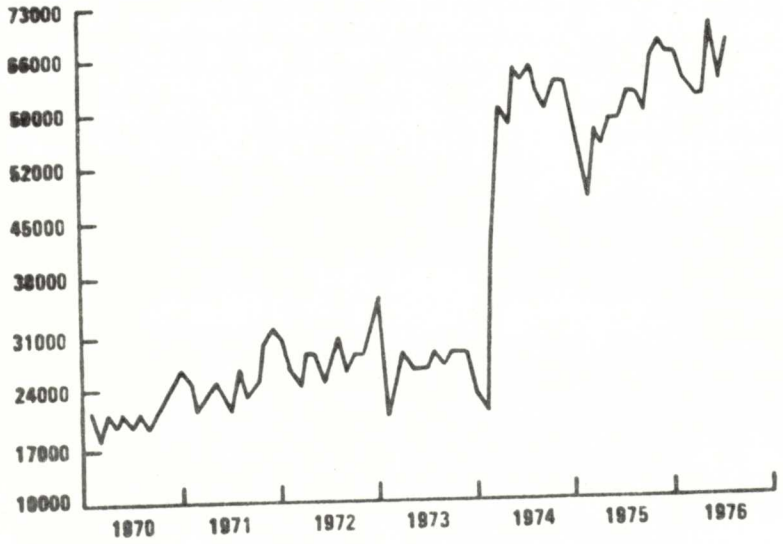
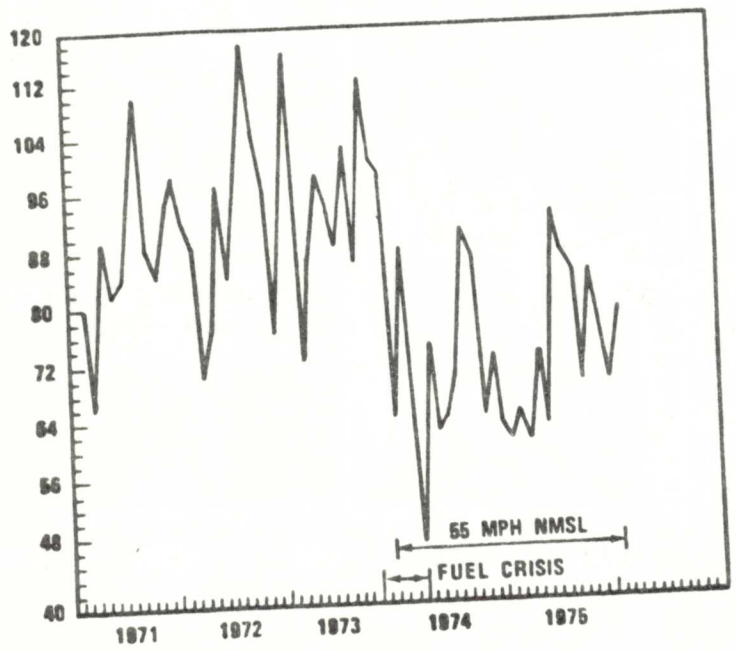



FIGURE IV-4
Fatal Accidents on 55 mph Roadway in Texas



In contrast, the fatalities on low speed roads, not effected by the 55 mph law, fell during the fuel crisis but immediately afterwards returned to their former level. Overall, NHTSA concluded that, in Texas, the 55 mph law prevented 19.8 fatal accidents per month during 1975 and 1976.

Illinois

A study similiar to the Texas study just described was conducted in Illinois. Once again, as can be seen from Figure IV-5, the police increased their enforcement efforts and speeding arrests increased rapidly. Once again, fatal crashes on high speed roads fell and remained below the previous level during 1974 and 1975 (see Figure IV-6). Meanwhile, there was a slight drop in fatalities during the fuel crisis on low speed roads, but a return to the previous level following the crisis. The study estimated that the 55 mph law reduced fatal accidents on interstate highways in Illinois by about 4 per month, and injury accidents by about 73 per month.

**FIGURE IV-5**
**Speeding Citations in Illinois**

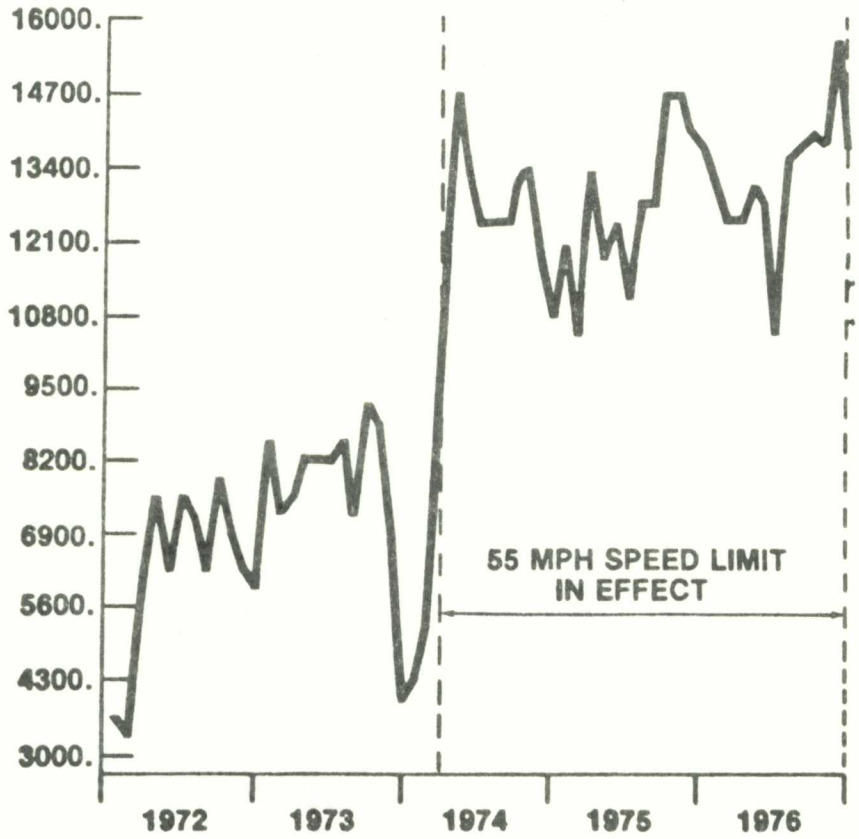
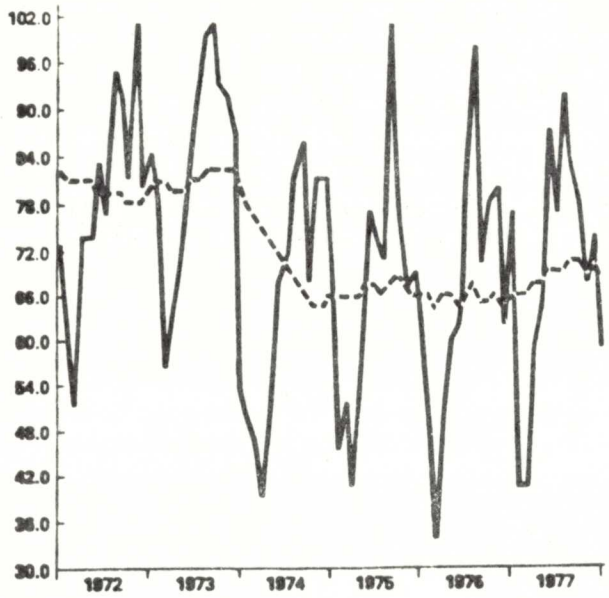


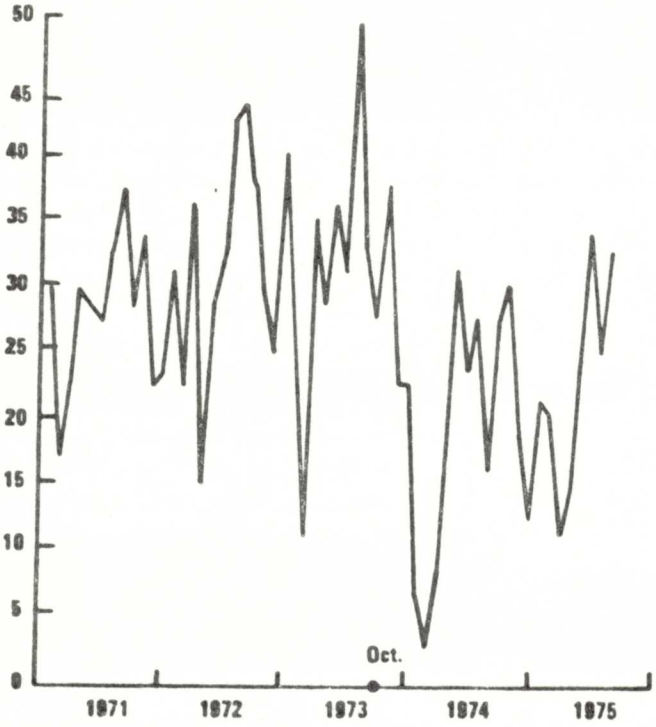
FIGURE IV-6
Fatal Accidents on 55 MPH Roadways in Illinois




Utah

In Utah highway fatalities fell following the fuel crisis as shown in Figure IV-7. An analysis of this change indicated that some of this reduction was due to the fuel crisis, but that the 55 mph law produced an estimated reduction of 9.6 fatal crashes per month during 1974 and 1975.

FIGURE IV-7
UTAH MONTHLY FATALITIES



North Carolina

A study of the fuel crisis and the 55 mph law in North Carolina conducted at the University of North Carolina indicated that there were 3.7 percent fewer accidents in 1974, the year following the fuel crisis, than in 1973. In addition, there were 11.2 percent fewer fatal crashes. The largest proportional decreases in fatal crashes were noted after the peak of the crisis. Fatal accidents declined 43 percent on interstate highways as compared to 19 percent on city streets. The researchers concluded that the reduction in crashes was greater than could be accounted for by the reduction in driving due to the fuel crisis.

Maine

The "Bear in the Air" State Police aircraft enforcement surveillance program has been in operation since 1975. It is considered a tremendous asset in their "55" selective enforcement program, as illustrated by the following results:

**TABLE IV-2**
**Results of Maine Aircraft Surveillance Program**

| Year | Aerial Citations | Citation Rate Per Hr. | % Exceeding 55 | (MPH) Avg. Speed |
|---|---|---|---|---|
| 1975 | 195 | 9.55 | 61.6 | 57.1 |
| 1976 | 136 | 6.67 | 70.0 | 58.5 |
| 1977 | 443 | 9.80 | 63.2 | 57.4 |
| 1978 | 911 | 14.96 | 51.2 (3/4 yr) | 55.6 (3/4 yr) |

Michigan

Major holiday weekends result in numerous fatalities caused by excessive speed and other hazardous driving actions in popular resort States like Michigan. With leadership provided by the Michigan State Police, a special enforcement project, "Operation CARE" (Combined Accident Reduction Effort), was initiated during the Labor Day holiday. Four States (Illinois, Indiana, Michigan, and Ohio) cooperatively publicized a special selective enforcement program. All media were used as well as kick-off ceremonies at rest areas to alert the public that the 55 mph speed limit would be enforced.

On the Operation CARE patrolled highways only one fatalityoccurred and that was on I-75 in Michigan. However, the 1977 fatality total in Michigan was 18, down from 31 for a like period in 1976, the lowest fatality total for a Labor Day holiday since 1961. This program was subsequently picked up by NHTSA and extended nationwide.

**Conclusion**

The national maximum speed law has apparently been highly effective in most parts of the nation in reducing the number of fatalities on high speed road-

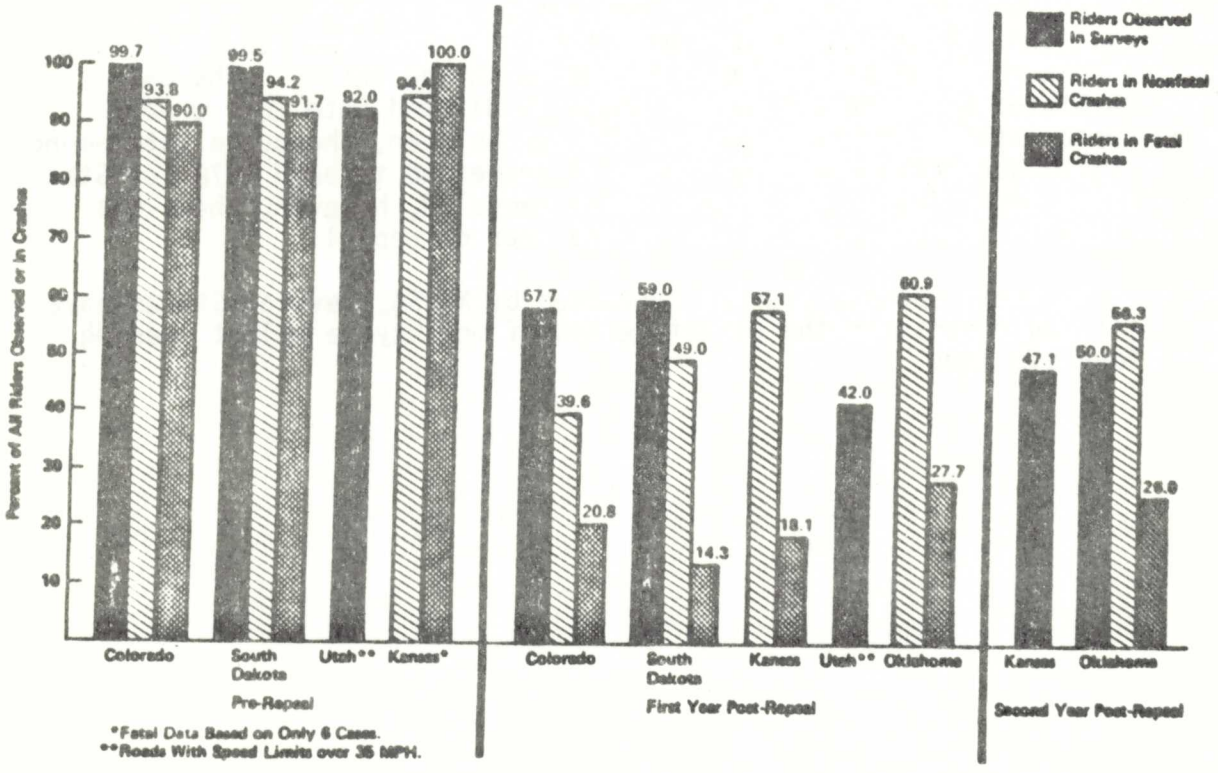
ways. The State and community program has made a significant contribution to this effort by setting enforcement goals and providing a source of funds for the increased enforcement activity required to achieve compliance.

## Motorcycle Helmet Usage Laws

In 1966, under the authority of the Highway Safety Act, the NHTSA issued a Motorcycle Safety Standard containing a requirement for the States to implement mandatory helmet usage laws. By the end of 1969, 40 States had adopted legislation requiring helmet use. By 1975 the number had grown to 47 States, the District of Columbia and Puerto Rico. That year the Secretary of Transportation initiated action to disapprove the highway safety programs of the three States without such legislation, but was prevented from taking action by the Highway Safety Act of 1976 which prohibited the withholding of 402 funds from a State which failed to require helmet use by riders over 18. Since that time, 27 States have repealed or revised their helmet use laws.

The repeal by some States of the helmet usage laws provided an opportunity to evaluate the effectiveness of this element of the 402 program. Studies were conducted in four States (Colorado, South Dakota, Kansas, and Oklahoma) which repealed their helmet usage laws in 1976 or 1977. These studies made clear that the helmet usage rate among riders observed on the roadways in States with mandatory laws was very high (over 90 percent). This usage rate fell to about 60 percent after repeal (see Figure IV-8). Moreover, the usage rates among riders injured or fatally injured in crashes decreased even more.

FIGURE IV-8
PERCENT OF RIDERS USING HELMETS BASED ON OBSERVATIONAL SURVEYS AND ACCIDENT REPORTS



The significance of being injured in a crash while not wearing a helmet is shown in Table IV-3. The probability of receiving a fatal head injury is two to five times more likely for unhelmeted riders. It is no surprise, therefore, that the number of fatal head injuries to motorcyclists went up following repeal of the mandatory usage laws (see Table IV-4).

**TABLE IV-3**
**Fatal Head Injuries Per 1,000 Crash-Involved Riders**
**(Helmeted vs. Nonhelmeted)**

| State | Helmeted | Nonhelmeted |
|---|---|---|
| Colorado | 9 | 23 |
| Oklahoma | 11 | 63 |
| South Dakota | 13 | 38 |
| Kansas | 6 | 41 |

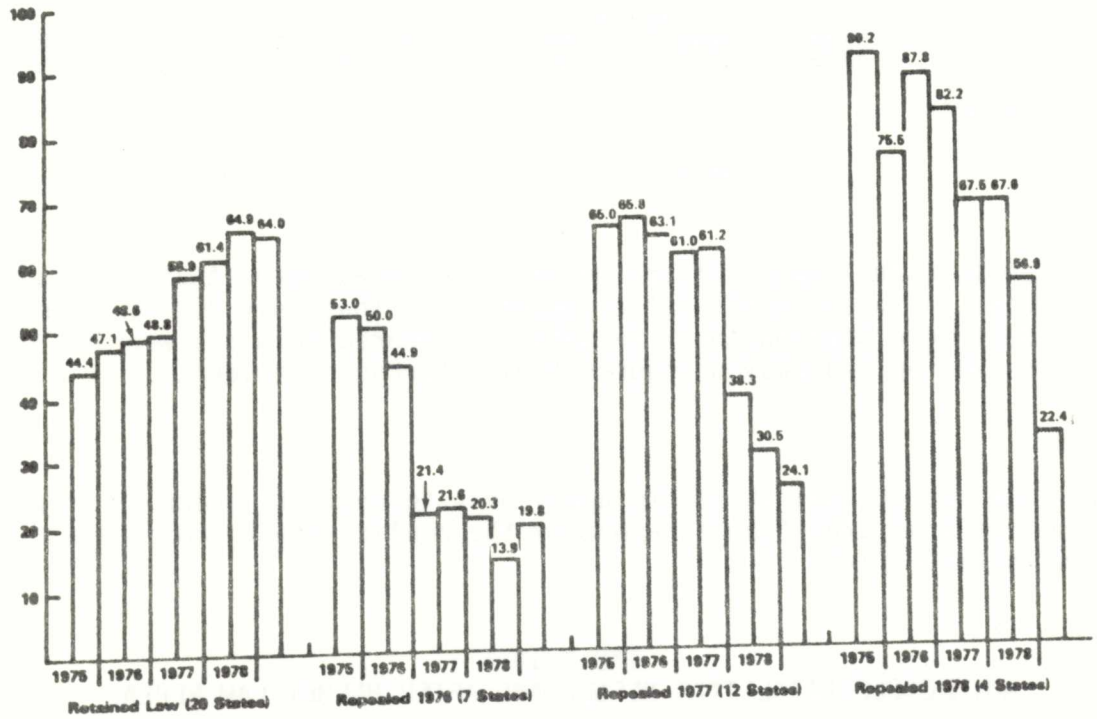
**TABLE IV-4**
**Fatal Head Injuries Per 1,000 Crash-Involved Riders**
**(Prerepeal vs. Postrepeal)**

| State | Prerepeal | Postrepeal |
|---|---|---|
| Colorado | 16 | 73 |
| South Dakota | 15 | 24 |
| Kansas | 6 | 28 |

That these results are not atypical of the nation as a whole is shown by Figure IV-9. This figure summarizes data from the Fatal Accident Reporting System which is a census of all fatal accidents in the nation. The data from the 43 States which report helmet usage is divided into four groups based on repeal status and repeal time. As can be seen, the usage rate among riders in fatal accidents remained steady or increased through 1978 for States which retained their laws. For States which repealed, however, there has been a decline in wearing rate following the year of repeal.

In addition to these special studies conducted by NHTSA, several States have issued their own reports on the effectiveness of motorcycle helmet wearing and mandatory use laws.

FIGURE IV-9
Motorcycle Helmet Usage in Fatal Accidents from NHTSA's
Fatal Accident Reporting System 6-Month Periods,
January 1975 through December 1978
By Helmet Law




Utah

In 1969, a law was adopted in Utah requiring motorcycle helmet usage only on roadways with a posted speed limit above 35 mph. The 1977 session of the Utah legislature passed a bill which relaxed helmet requirements to apply only to persons under 18 years of age. The helmet usage rate which in 1976 was 92% on roadways with speed limits over 35 mph fell to 42% after repeal. A study of motorcycle crash victims from 1975-1977 recorded 38 rider fatalities, 17 wearing helmets while 21 were unhelmeted at the time of the accident. Nineteen of the 21 without helmets suffered fatal head injuries, while only six of the 17 helmeted riders suffered fatal head injuries, most dying of other causes.

Washington

This State repealed its helmet usage law in September 1977. While the number of registered motorcycles increased 4% between 1977 and 1978 the number of rider fatalities increased 46%. A coroner's study found that 51% of riders without helmets who died in crashes sustained fatal head injuries as compared to 34% of crash involved riders wearing helmets.

Louisiana

Effective October 1, 1976, Louisiana amended its helmet usage law to apply only to riders 17 years of age and under. As shown in Table IV-5, the usage rate fell rapidly following repeal of the usage law.

**TABLE IV-5**
**HELMET USE REPORTED IN 1973-78 LOUISIANA MOTORCYCLE FATALITIES**

| | Before | | | | After | | |
|---|---|---|---|---|---|---|---|
| Helmet Use | 1973 | 1974 | 1975 | 1-10/76 | 10-12/76 | 1977 | 1978 |
| % Wearing Helmet Where Use Is Known | 78.8 | 84.4 | 87.1 | 70.5 | 42.9 | 22.2 | 21.2 |

A State report on the impact of the helmet law repeal noted that there was a 45% increase in fatality rate after repeal, and that only 20% of fatally injured riders were wearing their helmets as compared to a 50% wearing rate among riders who walked away uninjured from motorcycle accidents.

Minnesota

Minnesota amended its helmet law to apply only to cyclists under 18 on April 7, 1977. The results taken from a report by the public safety commission are shown in Table IV-6:

**TABLE IV-6**
**MOTORCYCLE FATALITIES BEFORE AND AFTER HELMET LAW REPEAL**

| | Pre Repeal | Post Repeal | |
|---|---|---|---|
| | 1976 | 1977 | 1978 |
| Motorcycle Fatalities | 57 | 94 | 106 |
| Rate Per 10,000 | 3.98 | 6.21 | 7.02 |

As can be seen, fatalities almost doubled by 1978. The study reported that 34 percent of the fatally injured unhelmeted riders died because of head injuries as compared to only 18% of the fatally injured helmet wearers.

New Jersey

In 1967, New Jersey passed a law requiring helmet use effective January 1, 1968. That law is still in effect. In a study conducted by the New Jersey State Division of Motor Vehicles during 1976, a comparison of accidents was made between the pre and post helmet law periods as shown in Table IV-7.

There were 477 motorcycle riders killed in New Jersey during the eleven year period from 1965 through 1975. The cause of death for 419 of those riders was indicated on the police accident reports. Ninety-five (95) of the 419 fatalities occurred during the pre-law period. None of the ninety-five (95) riders were wearing a helmet when the crash ocurred. (See Table IV-7) Sixty-nine (69) deaths were caused by injuries to the head. This represents 72.6 percent of the total fatalities for the pre-law period.

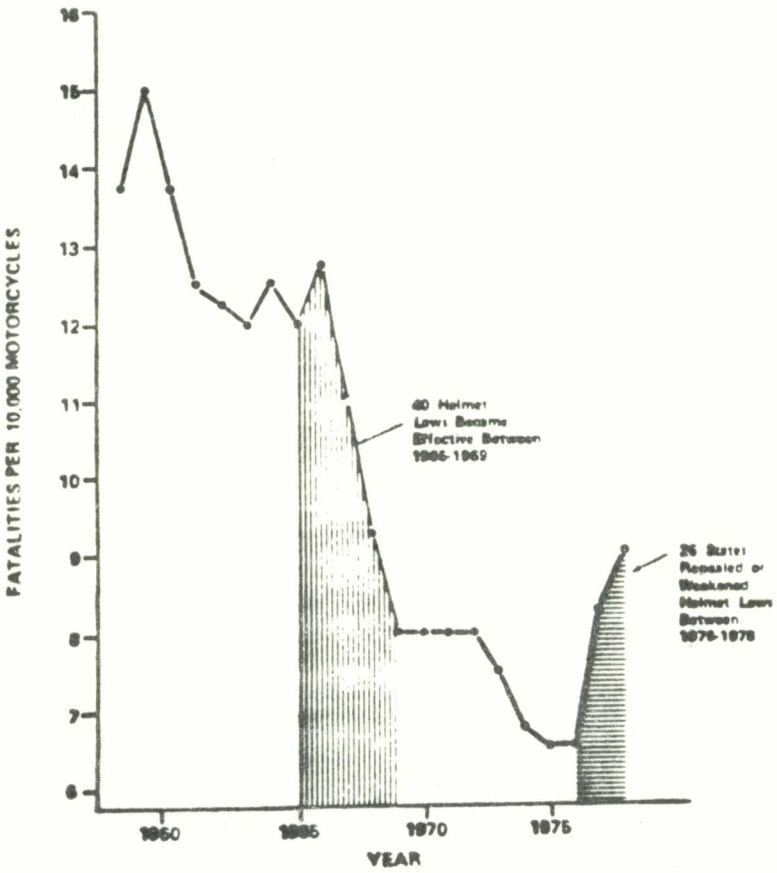
**TABLE IV-7**
**NEW JERSEY MOTORCYCLE RIDERS KILLED BY CAUSE OF DEATH**
1965-1975

| | Cause of Death | | % Head |
|---|---|---|---|
| | Head Injury | Other | Injury Deaths |
| 1965-1967 (No Helmets Used) | 69 | 26 | 72.6 |
| 1968-1975 (Helmets Used) | 157 | 167 | 48.5 |

During the law period, 1968 through 1975, 324 rider fatalities occurred where the helmet was used at the time of the crash. Of these 324 fatalities, 157 died of head injuries; and 167 died of other causes. The head injury fatalities for this period represent 48.5 percent of the total.

The overall effect of the passage and repeal of helmet usage laws is shown in Figure IV-10. From 1966 to 1969, 40 States inacted helmet laws and during this period the fatality rate dropped rapidly. Following the passage of the Highway Safety Act of 1976, 27 States repealed or weakened their helmet laws. Since that date, the fatality rate has been rising rapidly.

FIGURE IV-10
MOTORCYCLE FATALITIES PER 10,000 REGISTERED
MOTORCYCLES, 1958-1978




Aside from calling on the States to consider reenacting their mandatory helmet usage laws, NHTSA is urging that 402 funds be used to support voluntary usage programs. Whether public appeals for voluntary usage can produce results remains to be determined. A full report on the motorcycle helmet usage problem has been prepared in response to a requirement in the Highway Safety Act of 1978 and will be submitted to Congress by the Secretary in early 1980.

## Conclusion

The evaluation of motorcycle helmet usage laws has clearly established their value in reducing head injuries and the resultant deaths to motorcycle riders. The State and Community program made a major contribution to the enactment of this legislation. Currently, 402 programs are providing important evidence on the effectiveness of this measure which is leading some States to retain their legislation.

## Alcohol in Relation to Highway Safety

A major concern at the time the Department of Transportation was founded, as well as today, is the area of alcohol in relation to highway safety. This was reflected in a requirement placed in the original Highway Safety Act of 1966 for the Secretary to report to the Congress on this problem. This report was delivered in October of 1968 and indicated that alcohol played a role in approximately 50 percent of fatal crashes, and that the problem drinker rather than the social drinker was responsible for much of this problem. Standard Number 8 on Alcohol in Relation to Highway Safety played an important role in leading every State to enact legislation to strengthen their enforcement efforts by providing for chemical test for intoxication, and a presumptive blood alcohol concentration level of 0.10 percent alcohol.

The Standard did not contain provisions for improving court procedures or treating problem drinkers, however, so additional program elements were needed. These were provided by the Alcohol Safety Action Projects (ASAPs) which were conducted from 1970 to 1975. This 403 program went beyond the normal demonstration concept to establish projects in 34 States and Puerto Rico in a "Start Up" effort to stimulate the States to establish comprehensive community alcohol programs. Chapter V will outline the growth which has occurred in both the laws required by Standard 8, and the practices demonstrated in the ASAP program. The evaluation of the ASAP programs indicated that a comprehensive community program can deter social drinkers. However, no educational treatment program aimed at problem drinkers was found to be effective in reducing drunk driving.

A major impediment to the evaluation of alcohol programs is the lack of blood alcohol data on the drivers involved in crashes. A high BAC is the best evidence that alcohol could have played a role in the accident. Without such data, the evaluator is dependent on the investigating officer's judgement that the driver "had been drinking." Since many projects involve training and motivation of police officers to detect drunk driving, these projects are likely to find more drivers in accidents who "had been drinking," thereby making it appear that drunk driving accidents have risen. To avoid such subjective biases, many investigators use "surrogate" measures such as single-vehicle, late-night accidents which are most likely to be alcohol related in comparison to accidents which occur during the day. The aforementioned difficulties in finding an adequate criterion for alcohol related crashes have limited the number of studies of the effectiveness of alcohol programs.

### Maryland

In January 1977 the Maryland State Police initiated "Operation Yellow Jacket." This 402 supported project featured the use of off duty troopers paid on an overtime basis to selectively patrol high accident locations. The project emphasized better detection of speeding and drunk driving. To evaluate this program, the numbers of fatal and personal injury accidents occurring at the treatment locations were compared to a set of control locations, where there was no project activity from January through September 1977. The results are shown in Table IV-8.

**TABLE IV-8**
**Change in Alcohol Related Crashes**

| | Control Locations | | Treatment Locations | |
|---|---|---|---|---|
| | Fatal | Personal Injury | Fatal | Personal Injury |
| Expected Frequency | 13 | 342 | 21 | 518 |
| Observed Frequency | 17 | 341 | 13 | 464 |
| Percent Difference | +30.70% | -0.29% | -38.10% | -10.42% |

As can be seen, both fatal and personal injury alcohol related accidents were lower than would be expected, while fatal accidents were higher and personal injury accidents unchanged at control sites. The difference for personal injury accidents at the treatment sites was statistically significant.

Iowa

From 1972 to 1975 Iowa had a federally funded ASAP in Sioux City. This project was continued after 1975 with 402 funds and extended to seven other areas by 1977. In addition, drunk driving control programs were also established with 402 funds in four other urban areas. A preliminary evaluation of these programs was prepared by the Governor's Highway Safety Office in 1979. In this study, counties with programs were compared with counties without programs with the results shown in Table IV-9.

**TABLE IV-9**
**Comparison of Alcohol Related Fatal Crashes**
**Between 1978 and Base Trend Period of 1975-1977**

| | % Reduction in A/R Fatal Accidents |
|---|---|
| Counties with programs | 26.0% |
| Without programs | 5.6% |
| Statewide | 12.3% |

The report concludes that three of ten of the projects had no impact, one exhibited a statistically significant effect, the other six showed changes in the expected direction but not large enough to be statistically significant. When taken together, the 26 percent reduction in fatal alcohol accidents was statistically significant.

District of Columbia

In 1975 the District of Columbia initiated an alcohol safety program with 402 funds. This was a comprehensive program involving a special police enforcement unit with a mobile breath test van, a special prosecution unit in the Corporation Council's Office, a Driving Under the Influence (DUI) unit in the Probation Office of the Superior Court and other activities. The results of the program are shown below in Table IV-10.

**TABLE IV-10**
**Results of D.C. Alcohol Countermeasures Program**

| | DUI Arrests Per Year | Accidents Per Year | Fatalities Per Year |
|---|---|---|---|
| Pre-Program Period 1973-1975 | 1,208 | 28,195 | 76 |
| Program Period 1976-1978 | 3,833 | 24,377 | 56 |

Alcohol related fatalities averaged 51 percent of all fatalities during the 1972 to 1975 period. Since the initiation of the program, alcohol related crashes have averaged 36 percent of all fatalities.

Vermont

In Vermont, Project "CRASH" was established as a statewide Alcohol Safety Action Project in 1970 and continued with 403 funds until 1975. After that time it was funded with 402 funds. The current effort is limited to special enforcement teams at high frequency alcohol related crash periods, or weekend nights. While total fatal crashes in Vermont were up 12 percent in 1978, the fatal crashes during the hours patrolled by the special enforcement unit showed a 31 percent decrease. Alcohol related crashes occurring at these same locations were down 41 percent.

Louisiana

The City of Lafayette, Louisiana established a comprehensive alcohol program beginning in 1976. The project included safety measures involving enforcement, judicial, rehabilitation and public information and education areas. During the three years of operation, alcohol related crashes decreased 10.5 percent, alcohol related injury accidents decreased by 7.4 percent, and traffic fatalities decreased by 6.7 percent. In the same period the total number of all types of accidents, alcohol and nonalcohol, increased 15.3 percent.

California

During the period from December 1, 1977 to January 2, 1978, the California Highway Patrol initiated a special project using 402 funds entitled "Driving under the Influence (DUI) Reduction Month." Nineteen thousand five hundred overtime hours were devoted by the patrol to emphasizing DUI enforcement in 23 project areas. This enforcement activity was combined with a public information campaign. During the project period, 707 DUI accidents occurred in the project areas in comparison to the 848 accidents expected on the basis of previous trends.

Ohio

Under State statute, Ohio has a mandatory three-day jail term for first offender Driving While Intoxicated (DWI) convictions. Courts did not uniformly apply this sanction. In fact, the average penalty was a $200.00 fine, three days in jail, suspended, and a 90-day suspension of driving privileges. These traditional sanctions had minimal-to-normal impact on recidivism which was 50 percent. (Recidivism is defined as "rearrest for DWI within 18 months".)

To provide a more effective and constructive sanction system, Ohio initiated a "Class V" program providing for three-day incarceration at an alternative location, usually a dormatory; education seminar, to eliminate commonly held myths about alcohol; personal introspection through group/individual counseling; and self-supporting with fees paid by the offender, unless indigent.

The first Class V site was started in Athens, Ohio in 1975. Preliminary results (the 12-month recidivism rate at Class V sites runs about 10 percent compared to 50 percent in nonproject communities) were so encouraging that three additional Class V programs were started in 1976/77, another initiated in 1978, and one more in 1979.

**CONCLUSION**

Most of the alcohol safety programs involving increased enforcement evaluated by the States show small, short-term reductions in alcohol-related accidents. These results are in line with those of the ASAP program which indicated that social drinkers could be deterred through increased enforcement and education programs. The 402 program has played a major role in initiating these programs, many of which are now at least partially self-sufficient.

## Selective Traffic Enforcement Programs (STEP)

It has generally been assumed that to have maximum effect on accidents, police manpower and equipment should be concentrated at the times and places where crashes occur. This concept titled "Selective Traffic Enforcement," was made a feature of the Highway Safety Program Standard No. 15 on Police Traffic Services. To further stimulate local police to emphasize patrols at high accident locations, a series of five 403 "Selective Traffic Enforcement Programs" (STEPs) were initiated in 1972. These projects like the ASAPs were designed to be start-up efforts with emphasis on increasing State enforcement activity.

Another stimulus effort, funded under the 402 program was the Fatal Accident Reduction through Enforcement (FARE) program initiated by NHTSA in 1972 when it appeared that highway fatalities, after a leveling off period, were on the rise. The program, using $10 million in specially appropriated 402 funds, was initiated in the fall of 1972 as a fast response effort to be completed before June of 1973. The short time period the program was in effect limited the amount of data that could be collected and prevented the establishment of adequate control sites. As a result a scientific evaluation of this program was not possible. Nevertheless, the States were impressed with the success of the program and the crash reduction benefits reported were substantial. Of the 51 jurisdictions participating in FARE, fatal crash data were reported by 46. Of these, 40 reported a reduction in fatal crashes and fatalities, while 32 sites reported a decrease of at least 10 percent in injuries.

One example of a successful FARE program was reported in a special evaluation by the State of Alabama. It was found that for 13 counties included in the enforcement project there was a reduction in total accident frequency of 21 percent from the same time period in the preceeding years. Non-FARE counties also achieved a reduction when comparing the two time periods but the decrease was smaller -- 10 percent. Although these non-FARE counties were not subject to the concentrated police enforcement efforts, they were included in an extensive statewide publicity campaign occurring simultaneously.

With the use of 402 funds, selective enforcement projects have been developed and applied widely throughout the country. These projects are a feature of most State Highway Safety Plan Documents. In general, projects which have been evaluated to determine effectiveness in crash reduction or injury severity reduction have shown positive results. Overall, reported crash reductions in project areas have ranged from 7 percent to 33 percent. However many of the studies lack adequate control site data and cannot be considered scientific evaluations.

Ohio

The Dayton, Ohio STEP reported that the number of accidents at the six high accident locations included in the project dropped from 111 in 1978 to 74 in 1979, a 33 percent decrease.

Louisiana

The results of a rural selective enforcement project in Louisiana indicated an 11 percent decrease in total accidents for the project areas, compared to an increase of 31 percent in control, or nonproject areas.

California

A STEP operating in Sacramento, California reported that total accidents were reduced 13 percent in 1974 compared to a baseline period in 1971. There was a reduction of 994 noninjury, 347 injury and 24 fatal crashes.

Alabama

In a cost benefit analysis of radar units in Alabama, a "before/after" evaluation design was used to assess the reduction in injury accidents for 52 local agencies receiving speed detection radar units. Results from this accident reduction type of evaluation show that for the cities with radar units, the average number of injury accidents per 1,000 population dropped from 3.52 to 2.58. On the other hand, the accident rate for the State as a whole remained constant at 5.47.

South Dakota

An urban STEP in South Dakota has been operational in five communities since 1977. A recently completed indepth evaluation compared accident rates between the treatment group (STEP communities) and a control group (non-STEP communities). This was done for time periods both before and after the STEP's were implemented. The basic conclusion of the study was that the accident rates (whether considering fatal, injury, or total number of crashes) for the STEP communities did not change significantly since STEP became operational; however, the accident rates for the non-STEP communities did increase significantly during the same time frame. When considering fatal and injury crashes per 100 million vehicle miles, the rate for the treatment group was 222 for FY 1977 and 226 for FY 1978. The fatal and injury crash rate for the control group, however, increased from 228 to 256. Further, the total accident rate in the STEP cities during the first year of the program is the same as the preceeding year, while the total accident rate in the non-STEP cities increased by 18 percent.

**Conclusion**

Special selective enforcement activities of community police forces appear to be associated with reductions in fatal and injury accidents. However, additional scientific evaluations are required to confirm the effectiveness of these efforts and to determine what elements of the programs are most important in producing a reduction. The 402 program appears to have had an important role in spreading the concept of emphasizing enforcement at times and places where accidents occur and paying for the extra police effort requried to mount special patrols.

## Emergency Medical Services (EMS)

The Safety Standard on Emergency Medical Services attempts to define a response system which will reduce the likelihood of death and further injury following a crash. The NHTSA program has been highly successful as shown in Chapter V in encouraging the States to adopt comprehensive EMS plans and in upgrading ambulance equipment and paramedical training. Despite this success, most of the evidence for effectiveness of these programs to date is based on the intermediate measure of response time rather than in demonstrated reductions in death and injury. While there are many specific cases in which physicians will attest to the role of the ambulance service in preserving the life of an accident victim, there are no carefully controlled studies to show the overall reduction in injury and death which is provided by an EMS service. Currently, the NHTSA is involved in four evaluation projects designed to determine the lifesaving and injury reduction value of current State EMS programs. The results of these studies should be available by June of 1980. In the meantime, several States have performed evaluations of their own.

### Idaho

The State of Idaho provides an example of an EMS program evaluated in terms of its impact on response time. Based on an analysis of selected emergency response units, the average response times for both urban and rural areas have decreased. The average time required to reach the scene of accidents in urban areas was reduced from 7 minutes to 4.5 minutes in 1978. Likewise, for rural areas the average response time was lowered from 17.5 minutes (1972) to 12 minutes (1978).

### Georgia

Georgia provides another example of an EMS program evaluation based on response time. Of the 36 ambulances responding to the survey, one-third reported response time improvement of from 1 to 5 minutes; another 17 percent of the EMS mobile units reported response time improvements of more than 6 minutes. In 1977, ambulances responded to 33,000 injury crashes in Georgia of which almost 19,000 were classified by police as involving "incapacitating injury." In about 3 percent or 600 of these emergency responses, ambulance attendants reportedly suctioned the airway of the accident victim, in many cases saving his life.

Wyoming

The State of Wyoming evaluated their 402 supported EMS program and reported that 65 percent of accident victims who sustained life threatening injuries had been stablized enroute to the hospital (385 of 592 for the two-year study period). A separate Wyoming study showed that during a four-month period 50 persons who would have died without proper EMS (equipped ambulances and trained personnel) were received alive by hospitals and survived for a period thereafter.

North Dakota

North Dakota initiated an EMS project in which 719 EMT's were trained and certified. North Dakota now has 3,136 certified EMT's and this number makes the State number one in the nation for certified EMT's per capita. An additional ten ambulances were also purchased resulting in seventy-one percent of the State's population being within a seven-minute response time. Only one percent of the 1,164 traffic accident victims were dead on arrival at the hospital (12 DOA's). Various emergency departments reported on the 1,164 traffic related cases as follows during FY 1977:

1. In 80 cases lives were saved as a result of qualified intervention
2. In 196 cases the probability for permanent disability had been reduced due to qualified intervention.
3. In 182 cases the probable length of hospital stay was reduced as a result of qualified intervention.

**Conclusion**

The NHTSA EMS program has been highly successful in assisting the States to organize their emergency service programs and shorten response times. Evaluations of the lifesaving and injury reduction benefits of these improved programs are underway and the initial results appear promising.

## Pedestrian and Bicycle Safety

Pedestrian safety is recognized by NHTSA (Standard No. 14) as a significant feature in the overall highway safety program. NHTSA-supported research has concentrated on urban pedestrian and bicycle problems since the greatest portion of accidents occur in urban areas. In some large cities pedestrian fatalities represent about half of all traffic deaths. While pedestrian deaths make up a large portion of all highway fatalities (20 percent), this is a conglomerate problem made up of many different types of accidents, for some of which remedies are available. Because of the multiple causes of pedestrian accidents, any single safety program can only affect a relatively few accidents. The State and Community program (Section 402) has supported activities which give particular attention to the traffic environment, driver response and the education of pedestrians. Most 402 programs concentrate on school age children in grades K-3, or on preschool age children.

Utah

In Utah, six 402 funded pedestrian and bicycle safety projects were evaluated to assess their impact on fatality reduction. The analysis showed a significant

decrease in the trend of pedestrian/bicyclist fatalities since October 1, 1977, the date when the safety projects were implemented. Prior to project implementation, an increasing number of deaths were apparent each year. The cumulative effect of the 402 funded projects for the year 1978 was estimated to result in 15 fewer fatalities.

Minnesota

The City of Hasting, Minnesota implemented a three-year 402 project beginning in FY 1977. The bicycle/pedestrian safety project incorporated education, enforcement, and adjudication components. Results of the project show that during the three years, bicycle and pedestrian accidents declined from an average of eleven per year (for three prior years) to one in each year for 1977 and 1978. To date, there have been no accidents or fatalities for 1979. The City was so impressed with the results that it has included bicycle and pedestrian safety in the City budgets for 1979 and 1980.

Illinois

A 402 project pertaining to bicycle safety in Skokie, Illinois used a 10-member civilian bicycle patrol to enforce traffic laws applicable to bicyclists. The program operated during the summer of 1977 and was augmented by a public information and education campaign using the mass media. During the 13 weeks of the campaign over 5,000 enforcement contacts were made, resulting in nearly 4,000 written warnings and 93 citations. The number of bicycle accidents during the program period was reduced by 26 percent from the previous three-year, summer-month average (from 46 accidents to 34 accidents). The project was continued in the summers of 1978 and 1979 using 402 funds. For the three summers combined bike accidents were reduced 22 percent. The program will be continued in 1980 with local funds.

Indiana

A Model Ice Cream Truck Ordinance currently being disseminated by NHTSA through the 402 program was based on the successful experience of Indianapolis, Indiana. In 1971 Indianapolis enacted an ordinance governing the operation and equipment of ice cream trucks. Before enactment of this law, Indianapolis was experiencing about 15 vendor accidents per year -- accidents involving young children going to and from the street vendors. During the four months preceeding the passage of the ordinance, the City had already experienced more than 15 such accidents. In the subsequent four years however, there have been fewer than five vendor/pedestrian accidents.

Colorado

The experience of Denver, Colorado provides evidence for the effectiveness of the Bus Stop Program currently being disseminated by NHTSA. As early as 1969, the City recognized that benefits would accrue from relocating all city bus stops to the "far side" of intersections. An analysis of the pedestrian accident situation in Denver pointed to a number of pedestrian injuries and fatalities which resulted from bus stop accidents. By relocating the city's bus stop to the far side of intersections -- i.e., a bus stop after going through an intersection rather than stopping before the intersection for passenger loading and unloading -- the City hoped to reduce this type of

pedestrian problem. The logic for far side bus stops is that pedestrians crossing the street behind the bus should have better visibility of the intersection; further, auto and truck drivers should be better able to see the bus passengers exiting and entering a bus. In the first year subsequent to the relocation procedure the City had no bus stop related accidents.

A major pedestrian safety project in Denver was funded for three years with 402 monies and is continuing with the support of local funds. The project involves educational (K-3 grades), public awareness, selective enforcement, traffic engineering and traffic court components. An extensive impact evaluation to assess the program effects on pedestrian injuries and fatalities is underway but results are not yet available. Six years of baseline accident data (pre-project implementation) will be compared with three years of post-implementation data. The first fullyear of collecting accident data subsequent to project activities is 1979 and preliminary findings will be available in several months. No analysis of accident data has yet been done but early indications from this major project look promising. For example, no fatalities have occurred during the first full year of implementation among 5 through 9 year olds -- the target population for the K-3 educational program.

**Conclusion**

Pedestrian fatalities and injuries are one of the most intractable problems in highway safety because of the large number of causes which produce accidents. Effective safety measures appear to be available for certain types of pedestrian accidents and several of these have been employed by the States using 402 funds.

## Pupil Transportation Safety

The aim of this Standard is to reduce deaths and injuries to school children while they are being transported to and from school. Currently, 402 funds are used in activities to ensure adequate vehicle quality and transportation procedures. In particular, NHTSA has conducted Instructor Training Institutes for at least one pupil transportation expert in each State. Under the provision of section 406 of the Highway Safety Act, NHTSA has been supporting training programs for school bus drivers. An example of one such program is given below:

### New York

In New York State, 402 funded projects were designed to improve the level and increase the volume of training for school bus drivers. To date, more than 9,000 drivers have been trained using the new program; 981 during the 1976-77 school year; 4,489 during 1977-78; and over 3,600 during the 1978-79 school year received certificates. During the three years prior to the program there was an average of five fatalities each school year. Since implementation of the 402 projects, the number of statewide annual fatalities resulting from accidents involving pupil transportation have decreased: two for the 1976-77 academic year; three for 1977-78; two for 1978-79 and none for the first three months of the 1979-80 school year.

**Conclusion**

NHTSA 402 funds are supporting school bus driver training which is believed to be beneficial in reducing accidents. However, so few "school bus" fatalities occur each year it will be some time before scientific proof can be advanced for the effectiveness of this activity.

## Driver Education

Driver Education was a safety program of major interest to the States and Congress at the time the original Highway Safety Act of 1966 was enacted as indicated by the requirement in the Bill that each State have a program to provide driver training to all youths of licensing age. As shown in Chapter III a large portion of the 402 funds available in the early years of the highway safety program were devoted by the States to driver education. Since that time the effectiveness of driver education for high schoool youth has been challenged repeatedly by researchers and safety specialists who have argued that safety funds could be spent in more effective ways.

It is generally agreed (at least among research specialists) that driver education was initally accepted on the basis of faulty evaluations which correctly reported that course graduates had better driving records, but did not control for the initial differences between the individuals who volunteered for driver education and those who chose to learn by other means. It turned out that those who volunteered for driver education were likely to be safer drivers in any case, so that it was not possible to tell to what extent their better records resulted from taking the course itself. Later evaluations, where the differences between volunteers and nonvolunteers where more carefully controlled, showed little or no benefit for driver education.

To help settle this long standing controversy over a program which is receiving a major amount of 402 funds, NHTSA began in 1968 to develop a comprehensive model driver education program which could provide a critical test of the effectiveness of driver education. Currently this program is being evaluated in DeKalb County, Georgia. Care has been taken to randomly assign applicants to the course and to an untreated control group so that individual personality and temperment will not obscure the results. Data on this evaluation should begin to be available in another six months but the final results are two years away.

Meanwhile, under economic pressure the States have been cutting back on their funding for driver education and NHTSA has been encouraging the States to use 402 funds for higher priority problems. Several States have attempted to evaluate their high school driver education programs and offender driving schools. In general, these evaluations have been weak because the States have not been able to randomly assign individuals to these programs so as to eliminate the effects of individual personality differences. Moreover, when offenders are placed in almost any type of program there is a tendency for their driving records to improve because of a statistical phenomena known as "regression to the mean," which simply refers to the fact a person who had the "bad luck" to receive several tickets will probably have fewer citations during the next year -- by chance alone. Three recent studies that illustrate those which the States have been conducting are described below.

Indiana

In Indiana, for example, a defensive driving program which operated in 15 counties during 1975 was evaluted to determine impact on traffic violations and on traffic accidents. Driver history records of 427 drivers completing the course were used to assess program effectiveness. Driving records covering a two-year period prior to course instruction were compared to records for a similar period subsequent to course completion. In addition to significant reductions in the number of violations committed after the training, there was also a reduction in the number of accidents between the pre- and post-periods.

Alabama

Alabama undertook a cost benefit analysis of high school driver training in the early 1970's. The driver histories of 182 students who had received their licenses during the 1969-1970 school year were assessed for evidence of violations and accidents over the following few years. The 76 students who had completed the driver education course were compared with 106 students who had not taken the instructions. Table IV-11 presents the findings, which show that students completing the course had fewer violations as well as fewer accidents.

**TABLE IV-11**
**Alabama Analysis of Driver Training Course**

| | Total | # With Violation | # With Violation | # With Accident |
|---|---|---|---|---|
| Students with Driver Training | 76 | 7 | 9.2% | 0 |
| Students without Driver Training | 106 | 20 | 18.9% | 2 |
| **Total** | 182 | 27 | 14.8% | 2 |

North Carolina

An example of a negative finding from an evaluation of a 402 funded driver training program is provided in a University of North Carolina study which assessed the effectiveness of multi-vehicle driving ranges as a tool in the driver education system. Two samples of students, one comprised of those taking training on the experimental range facilities and the other comprised of those receiving the standard training course, were compared in terms of accident involvement. The study concluded that no significant difference between the range group and the control group were evident. In fact, the slight differences noted favored the control group -- i.e., various demographic subsets of the control group had fewer accidents and violations than their range-trained counterparts.

**Conclusion**

The effectiveness of high school driver education is still in doubt. NHTSA has developed a high quality driver education program which is currently

being evaluated. Until such a time as the value of drive education is demonstrated, NHTSA is encouraging States to use 402 funds in higher priority areas.

## Periodic Motor Vehicle Inspection

It has traditionally been believed that defective vehicles contribute to accidents. This belief led to the promulgation of Standard Number One requiring States to establish Periodic Motor Vehicle Inspection Programs (PMVI) and the specification of a corresponding set of Vehicle in Use Standards which specify the criteria to be used in determining whether a safety defect exists. In the last decade there has been extensive research to determine the extent to which defects cause accidents, and the results of these studies funded by NHTSA, the States, and foreign governments suggest that from 6 to 12 percent of highway accidents result from vehicle defects.

To evaluate the effectiveness of PMVI and the 402 expenditures devoted to this problem area (about one percent of total 402 obligations), it is necessary to demonstrate that States with good PMVI programs have fewer vehicles on their roads with significant safety defects and that this in turn leads to a lower rate of crashes where defects are judged to play a causal role.

The first step in this demonstration has been made. States with more frequent inspections have reduced a number of vehicle defects. In general, semi-annual inspections of all vehicles result in fewer outages than is the case in States which inspect the vehicle population partially, less frequently, and less thoroughly. A comparison of inspection programs in Pennsylvania, New Jersey, District of Columbia, and California, showed that the Pennsylvania program, which is superior to the others in frequency, coverage of total vehicle population, and perhaps quality of inspection, had decidedly fewer vehicle outages. One comparison of outages in the study was Pennsylvania, 9.01 percent; New Jersey, 11.84 percent; California, 13.13 percent. Another comparison: Pennsylvania, 5.93 percent; the District of Columbia, 7.44 percent; New Jersey, 8.93 percent; California, 10.70 percent.

These figures are the basis for stating that one-third to one-half of vehicle outages can be reduced by rigorous inspection such as that provided in the Commonwealth of Pennsylvania. The overall result was summarized as follows: "Based on overall outage rate comparisons, there is a significant difference between States that have PMVI and those that have random motor vehicle inspection, where the State with two inspections per year utilizing privately operated vehicle inspection stations produces vehicles in significantly better condition than the States with one inspection annually, which in turn produced vehicles in significantly better condition than the vehicles in the States with random motor vehicle inspection." Vehicle inspection reduces the number of defects in vehicles in use and, on the whole, the extent of this reduction is one-third to one-half.

Another type of evidence for the effectiveness of PMVI comes from "before and after" studies of States who have repealed their inspection laws. On June 30, 1976, Idaho repealed its mandatory PMVI law. Subsequently, a study was undertaken to detemine the difference in the mechanical condition of vehicles under a PMVI program and without such a program. A "before" and

"after" study involving some 3,500 (1,565 in 1976 and 1,850 in 1978) vehicles was designed to assess any differences. The "before" data was collected in the period September-December 1976, and the "after" data was collected during the same period in 1978. Preliminary analysis indicates a statistially significant increase in the outage rates for the brake, steering, suspension, and power train subsystems in the two-year period following Idaho's repeal of its PMVI law.

The second step in proving the effectiveness of PMVI, demonstrating that States with good PMVI programs not only have fewer vehicles with safety defects, but also have fewer accidents caused by defects, remains to be taken. One difficulty is the problem of obtaining good information on the role of vehicle defects in accidents since the investigation is normally done by a police officer who has neither the knowledge or equipment to make such judgments. While the final proof of effectiveness remains to the future, the fact that defects have been shown to cause 6 to 12 percent of accidents and a strong PMVI program has been shown to reduce defects by a third to half suggests that the safety benefit lies somewhere between two to six percent.

**Conclusion**

Inspection programs promoted by Safety Standard Number 1 and 402 funds have succeeded in increasing the number of States with PMVI programs. States with such programs have been shown to have fewer vehicles with safety system outages than States without such programs. The extent to which these safer vehicles contribute to a reduction in accidents is not known.

## CHAPTER V

## STIMULUS AND GROWTH EFFECT OF 402 PROGRAM ON THE QUANTITY AND QUALITY OF STATE SAFETY ACTIVITIES

Section 402 grant funds have been traditionally viewed as "seed" money to help State and local governments start projects that they might not initiate on their own. These funds are intended to encourage the implementation of modern techniques and to encourage expanded highway safety efforts by States and communities. Seed money projects differ from other Federal assistance approaches in that projects are started with the presumption that Federal funding can end and be replaced with State, local, and other funding sources. As will be seen, NHTSA 402 funds have generated some self-sustaining projects which use significant amounts of non-Federal funds. Overall, non-Federal funding accounts for about 97 percent of total highway safety program costs.

This Chapter will examine the extent to which 402 grant funds have acted as a stimulus to spur State and local funding in highway safety. More specifically, we will examine the stimulus effect of 402 funds on program planning and management and the other eight major program areas which receive the bulk of the Federal funding. Our analysis will be in terms of overall system improvements, initiation of new countermeasure activity, program expansion, productivity increases, responsiveness to changing conditions and growth of non-Federal funds being applied at State and local levels to highway safety.

### Stimulus in Program Management

During the early years of the 402 program, planning and evaluation, of even a rudimentary nature, were difficult to find except on an isolated basis. Initial efforts of State Highway Safety agencies concentrated on obligated Federal grant monies, with little or no planning required. Projects, such as equipment purchases to strengthen or upgrade existing services, characterized this period.

It soon became apparent to program managers at all levels in the Federal/State/Local process, that a group of uncoordinated projects was not a program. It did not promote sound management practices. It did not encourage program focus on the root causes of safety problems. It did not promote systematic planning toward desired goals. Stringent requirements for personnel in terms of traffic safety background, management, and evaluation expertise were not perceived as critical to program development and success. Questions posed by Federal and State legislators relating to dollars spent versus continued increases in highway deaths and injuries forced these program managers to think in terms of cause and effect, and to search for more effective long-range crash reduction programs.

State and Federal funding policies were developed to encourage more sophisticated management techniques. Comprehensive program planning and evaluation techniques were advanced to meet what were becoming very obvious needs. All States now use the new Highway Safety Plan which emphasizes problem identification, countermeasure selection and evaluation. Budget documents prepared by State agencies emphasize the goal of crash injury and death reduction to justify their requests. Most State Highway Safety Agencies have added staff members

with knowledge and expertise in long-range planning, evaluation, and reporting of statistical data. Specialized staff functions have been instituted to develop interagency budgets, interagency coordination, and increased use of record systems. Management capabilities of State and Federal traffic safety personnel have been strengthened through development of manuals on problem identification, data analysis and reporting techniques, and evaluation, and through training courses conducted at the Traffic Safety Institute (TSI) in Oklahoma City, State and local universities, and national/regional workshops. Nearly 600 highway safety program managers have been trained at TSI alone in the past five years.

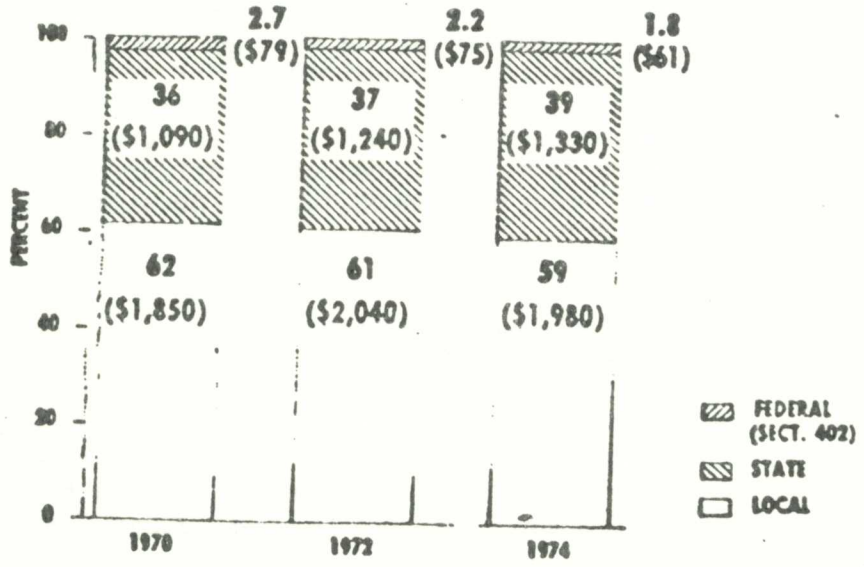
## State and Local Funding

As previously noted, the Federal 402 grant funds are only a small percentage of a State's total highway safety program expenditures. The principal sources of revenue for State financing of traffic safety programs are gasoline and fuel taxes, motor carrier taxes, motor vehicle registrations and fees, motor vehicle inspections and operator license fees. These funds are allocated from general funds, agency earnings or special trust funds.

Counties and municipalities allocate funds for traffic safety projects from a number of sources, including a prorated return of monies collected in their jurisdictions for taxes, and licenses and fees, supplemented by revenue from real property taxes, personal property taxes, fines and forfeitures and miscellaneous traffic assessments.

Trends show that State and local governments are shouldering the major share of total program costs. This was one of the major findings of the July 1975 program performance assessment covering the FY 1969-FY 1974 period as illustrated in Figure V-1 below. As can be seen the State share of total costs was increasing while both the Federal and local portions were declining.

FIGURE V-1
EXPENDITURE DISTRIBUTION BY LEVELS OF GOVERNMENT
PERCENT AND (MILLIONS OF $)



That study of Federal and State/local expenditures was based on a ten State sample. It considered the total capital outlay and operational costs for traffic safety programs. Federal 402 expenditures amounted to slightly over two percent of total expenditures nationally. Due to time limitations, a restudy of the total expenditures of the same ten sample States could not be completed for the FY 1975-79 402 assessment; however, the total expenditures of one of the sample States, Florida, were studied. Florida is close to the national mean in such characteristics related to traffic safety as mileage death rate, percent urban population, alcohol consumption per capita, per capita income, population per ambulance, road density and percent of State road mileage. For FY 1979, Florida expended $150.7 million in total State and local dollars in the NHTSA program areas, which, when compared to Federal 402 funds expended, represented 96.8 percent of total highway safety costs. The 3.2 percent of 402 expenditures in FY 1979 is nearly the same as the two to three percent estimate for the Federal 402 share of total highway safety expenditures existing in 1974 and appears reasonable today.

## 402 Stimulus Effects

The stimulus effect of 402 grants can be observed in practically every area of State and local safety activity. The following discussions illustrate certain of these effects in several of the more significant program areas.

### Alcohol Safety

Table V-1 indicates the estimated growth in the number of jurisdictions adopting alcohol countermeasures promoted through the 402 programs since FY 1969.

**TABLE V-1**
**Growth of Alcohol Countermeasures in Jurisdictions**

| Alcohol Countermeasures | Number of Jurisdictions FY 1969 | FY 1974 | FY 1977 | FY 1979 |
|---|---|---|---|---|
| Alcohol Enforcement Patrols | 240 | 590 | 733 | 858 |
| Background Investigation | 4,060 | 4,960 | 5,459 | 5,810 |
| Referrals to Rehabilitation | 1,550 | 4,060 | 4,708 | 5,462 |
| Rehabilitation Follow-up | 170 | 1,520 | 1,836 | 2,185 |
| Public Information and Education | 1,260 | 2,340 | 2,952 | 3,380 |

Table V-2 shows the number and percentages of State level jurisdictions implementing each of the key alcohol standard elements. The data for 1966 includes 52 jurisdictions: fifty States, the District of Columbia, and Puerto Rico. The data for 1974 and 1979 add three more jurisdictions: American Samoa, Guam, and the Virgin Islands.

**TABLE V-2**
Alcohol Standard Implementation **Status**

| Key Alcohol Standard Elelments | 1966 NUM | 1966 PCT | 1974 NUM | 1974 PCT | 1979 NUM | 1979 PCT |
|---|---|---|---|---|---|---|
| BAC Test | 31 | 60 | 50 | 91 | 55 | 100 |
| DUI + .10 BAC | 7 | 13 | 48 | 87 | 54 | 98 |
| Presumptive Evidence | 23 | 44 | 49 | 89 | 54 | 98 |
| Implied Consent | 19 | 37 | 50 | 91 | 54 | 98 |
| Dead Drivers and Ped. Test | 13 | 25 | 40 | 73 | 45 | 82 |
| Surviving Driver Test | 4 | 8 | 17 | 31 | 21 | 38 |
| Personnel Qualifications | 21 | 40 | 50 | 91 | 55 | 100 |
| Specimen Procedures | 22 | 42 | 49 | 89 | 55 | 100 |
| BAC Results | 19 | 37 | 45 | 82 | 54 | 98 |

Steady growth in the adoption of these key elements shows widespread support for the major elements of this standard as a basis for implementing alcohol countermeasure programs.

As programs initiated or expanded by Federal support have become validated and accepted, State and local funding has gradually been appropriated. The State and local funds have usually resulted from client fees collected, fine assessments, or special alcohol "bottle taxes." Thirty States now have alcohol safety schools that are self-supported by client fees. Four States that have enacted and implemented client fee legislation report that an alcohol countermeasure program can be run at minimal cost to the taxpayers of a community, since most of the support can come from the offenders who create the problem.

An important measure of the effectiveness of an alcohol safety program is the number of drunk driving arrests. Table V-3 presents a national estimate of the number of drinking drivers arrested, since 1969, as related to licensed drivers and total citations:

**TABLE V-3**
**Drinking Driver Arrest Trend**

| | 1969 | 1974 | 1977 | 1979 |
|---|---|---|---|---|
| Total DUI Arrests (thousands) | 561 | 1,130 | 1,262 | 1,333 |
| DUI Arrests Per 1,000 Licensed Drivers | 5.2 | 9.1 | 9.1 | 9.1 |
| DUI Arrests-Percent Serious Traffic Citations | 8.7% | 13.2% | 11.5% | 12.7% |

Total DUI arrests doubled between 1969 to 1974. From 1974 on, arrests have increased at the same rate as licensed drivers. The percent DUI arrests of serious traffic citations nearly doubled from 1969 to 1974, but leveled off from 1974 to 1979 to an average of about 12 percent. The low percentage in 1977 reflects the shifting of more enforcement effort to 55 mph compliance control, at some sacrifice of alcohol enforcement activities.

Breath testers are now used in all States to determine the BAC of persons arrested for DWI. The number of breath testing devices has increased among the States from a pre-1970 level of 3,000 to over 15,000 in 1977.

Some jurisdictions have enacted laws which make it easier to apprehend the DWI offender, thus adding to the police officer's incentive to make DWI arrests. The Illegal Per Se Law has been enacted in 12 States; the Preliminary Breath Screening Law has been enacted in 14 States; nine States suspend or revoke a drivers license for refusal to take a preliminary breath test; and 17 States allow a police officer who has not witnessed a DWI offense to make a DWI arrest without first obtaining a warrant.

Increased DWI arrests have required the courts to handle an ever-increasing number of alcohol-related driving cases. The judicial emphasis in the handling of DWI cases has moved from purely punitive sanctions for drunk drivers to rehabilitation as shown in Table V-1. To date, 40 States have given judges discretion to sentence offenders to rehabilitation programs. Seventeen States now have some type of training program for judges on better methods of handling DWI cases. In addition, 46 States have enacted a limited-license law which permits the issuance of a restricted license to those individuals convicted of a DWI offense on the condition that DWI offender will attend an alcohol rehabilitation program. Probably the most dramatic addition to the rehabilitation system has been the alcohol safety school for first offenders, now functioning in 32 States.

Before the national emphasis program on alcohol, few States employed public communications as an important element of their highway safety programs. Most campaigns were conducted at the community level and addressed general drinking and driving topics. Using modern marketing and mass communications techniques, at least 39 States now have active public communication programs to combat drunk drivers. Professional staffs are employed to manage these programs. States are using a variety of information techniques including radio and TV public service announcements, pamphlets, films, speakers bureaus, and news and editorial releases.

Pennsylvania and Texas provide examples illustrating the scope and variety of alcohol safety public communication programs underway among the States. Pennsylvania's public communications effort has developed over the past three years from a limited effort to a full-scale, professionally managed program employing a full-time manager with a budget of $350,000 per year. The Texas' mass media campaign to increase public awareness of drinking and driving reaches 65 TV stations, 350 radio stations, and 600 daily and weekly newspapers.

**Police Traffic Services and Adjudication**

Police traffic services are the most extensive and expensive of the traffic safety programs. The traffic officer's duties and responsibilities cut across a number of other related program areas, such as accident investigation and reporting, emergency medical services, traffic safety education, traffic courts, motor vehicle inspection, pedestrian safety, motorcycle safety, alcohol safety and debris control.

Since 402 funding of these related program areas generally include the costs of police services, the 402 and State/local funds for police traffic services,

covered in this assessment, are related most directly to the manpower, equipment, facilities and training required to implement highway enforcement programs.

During the FY 1975-FY 1979 period, 32.7 percent of total funds were obligated to police traffic services, compared to 21.6 percent obligated from FY 1967 to FY 1974. This growth resulted from an increase in 402 dollars earmarked for the high payoff areas of alcohol safety and 55 mph enforcement.

Police Traffic Manhour Trends

During the earlier years of the NHTSA 402 State and Community Grant Program, a large portion of funding was directed toward State enforcement agencies with 75 percent of their manhours devoted to traffic patrol services. In recent years, more funds are being allocated to improving the selective enforcement activities of local police to reduce alcohol and hazardous moving traffic violations. As indicated in Table V-4, local police traffic manhours have increased 63 percent over the ten-year period, compared to 14 percent for State police traffic manhours. In addition, the average annual traffic manhours for a local traffic officer increased from 850 in FY 1976 to 1,312 in FY 1979, while a State police officer's annual traffic manhours have remained at about 2,000 over the same period:

**TABLE V-4**
**Growth in Selective Enforcement Activities**

| | Traffic Manhours (Millions) | | | | |
|---|---|---|---|---|---|
| | FY 1969 | FY 1974 | FY 1977 | FY 1979 | % Change 1969-1979 |
| State Police/Highway Patrol | 47.9 | 50.5 | 53.1 | 54.8 | +14% |
| Manhours Per Officer | 2,004 | 1,996 | 2,074 | 1,991 | -- |
| Local Police | 198.8 | 266.3 | 300.0 | 324.0 | +63% |
| Manhours Per Officer | 850 | 1,091 | 1,225 | 1,312 | +54% |

Considering that licensed drivers have increased 35 percent and vehicle miles of travel 48 percent, between FY 1969 and FY 1979, a measure of the traffic enforcement effort is to relate manpower to traffic growth, shown in Table V-5:

**TABLE V-5**
**Relationship of Traffic Enforcement Efforts to Traffic Growth**

| | FY 1969 | FY 1974 | FY 1977 | FY 1979 |
|---|---|---|---|---|
| Traffic Manhours Per 1,000 Licensed Drivers | 2,278 | 2,547 | 2,557 | 2,592 |
| Traffic Manhours Per Million Vehicle Miles Traveled | 231 | 247 | 239 | 241 |

Recognizing that the FY 1974 manpower rates are somewhat elevated due to the effect of the energy crunch on driving patterns, it appears that the total traffic enforcement effort is keeping pace with the driver and vehicle exposure growth.

Enforcement Activity

A direct measure of traffic enforcement effort is the number of traffic citations issued. A ratio is established below, between traffic citations (except parking) and traffic manhours of patrol for State Police/Highway Patrol and local police.

**TABLE V-6**
**Total Traffic Citations in Traffic Enforcement Effort**

| | Traffic Citations Per 100 Traffic Manhours | | | |
|---|---|---|---|---|
| | FY 1969 | FY 1974 | FY 1977 | FY 1979 |
| State Police/Highway Patrol | 15.7 | 21.4 | 26.9 | 27.9 |
| Local Police | 9.6 | 10.2 | 10.1 | 10.5 |

Although the rate of local police citations per 100 traffic manhours shows little increase over the years, the State Police/Highway Patrol citation rate has increased 78 percent since 1969. That increase may be due, primarily, to the major emphasis of State enforcement agencies on 55 mph compliance; State agency arrest data between 1973 and 1979 indicates a 43 percent increase in speeding arrests and a 28 percent increase in DUI arrests.

The category of "serious violation" citations is examined in Table V-7; this category represents about 25 percent of total violations and includes DUI, reckless driving, hit and run, accident-related violations, driving under license suspension and felonies committed with a vehicle:

**TABLE V-7**
**Serious Violation Citations in Traffic Enforcement Effort**

| | Serious Violation Citations (Millions) | | | | |
|---|---|---|---|---|---|
| | FY 1969 | FY 1974 | FY 1977 | FY 1979 | % Change 1969-1979 |
| State Police/Highway Patrol | 1.4 | 1.8 | 2.1 | 2.2 | +57% |
| Local Police | 5.1 | 6.8 | 7.7 | 8.3 | +63% |

The larger numbers of serious violations cited by local police reflect the close relation of these types of violations to urbanized areas. The larger percentage increase for local police would be expected in view of the 54 percent increase in manhours per officer in traffic since 1969.

## Adjudication of Traffic Violators

Between 1972 and 1979, a number of States reorganized their court systems with the objective of establishing a new court system or eliminating some of the Limited and Special Jurisdiction Courts. The change in courts hearing traffic cases is shown in Table V-8:

**TABLE V-8**
**Courts Hearing Traffic Cases**

| Type, Traffic Courts | FY 1972 | FY 1979 |
|---|---|---|
| General Jurisdiction (estimate) | 3,630 | 3,571 |
| % Hearing Traffic Cases | 28% | 24% |
| Limited and Special Jurisdiction (estimate) | 13,221 | 12,215 |
| % Hearing Traffic Cases | 81% | 85% |
| 402 Obligations to Courts (millions) | $ 1.2 | $ 3.5 |

While reorganization has resulted in a reduction in the number of traffic courts, the percentage of Limited and Speed Jurisdiction Courts hearing traffic cases increased -- due to increased enforcement activities and traffic citations. In Courts of General Jurisdiction, nearly 90 percent of the judges spend only 10 percent or less of their time on traffic cases. In contrast, in Limited and Special Jurisdiction Courts, over 50 percent of the judges spend from 50 to 95 percent of their time on traffic cases.

The 402 funds have increased 192 percent from FY 1972 to FY 1979 to provide better adjudication processes, better trained adjudicators and more efficient and timely handling of traffic case loads. In three States, a system of administrative adjudication is being developed to expedite processing of traffic infractions in a nonjudicial setting, consolidate records systems and handle referrals for driver improvement, using driver histories.

The State of Alabama, for example, extensively upgraded their traffic courts system in December 1975, placing them under the administration of the State Supreme Court. Besides the actual restructuring of the court system, a statewide uniform traffic citation was developed, a records system for recording and tracking the disposition of citations was established, and an extensive training program was initiated and is continuing. Over $1 million in 402 funds has been used to support this effort. Section 402 funds have also assisted in establishing a court referral program for those convicted of driving while intoxicated (DWI). Presently, there are fifty separate DWI schools in operation throughout the State serving approximately 400 traffic court judges in 67 counties.

Table V-9 shows trends in court conviction rates for total violation citations and serious violation citations issued by all police, State Police/Highway Patrols and local police, from FY 1969 to FY 1979.

**TABLE V-9**
**Traffic Conviction Rates**

| Traffic Citations Issued by Police Category | Percent Convicted FY 1969 | FY 1974 | FY 1977 | FY 1979 |
|---|---|---|---|---|
| o All Police | | | | |
| - For All Violations | 77% | 77% | 78% | 78% |
| - For Serious Violations | 65% | 67% | 80% | 84% |
| o State Police/Highway Patrol | | | | |
| - For All Violations | 88% | 96% | 76% | 78% |
| - For Serious Violations | 92% | 89% | 90% | 95% |
| o Local Police | | | | |
| - For All Violations | 73% | 73% | 79% | 78% |
| - For Serious Violations | 59% | 62% | 66% | 69% |

The higher conviction rate of State enforcement agencies for serious violations is due to more selectivity in citing violations, better preparation of case evidence and more time spent on enforcement. The conviction rate for local police violation citations, on the other hand, has improved since 1969, reflecting improved enforcement procedures and increased traffic manhours per officer.

**Emergency Medical Services**

Emergency response to victims of traffic accidents and other medical emergencies has improved dramatically since the advent of the 402 program. This has occurred largely through technical assistance and financial leverage on State actions and financial commitments. As a result, fast responses to victims have increased significantly, and adequate care has become the rule not the exception. The United States Emergency Medical Service (EMS) system is now judged the finest in the world.

Throughout these developments, the primary objectives have been to reach victims promptly, provide effective medical care at the accident scene (administered by trained Emergency Medical Technicians (EMTs) in constant contact with emergency room physicians), and to continue treatment enroute to an appropriate medical facility. The overriding goal remains: To stablize victims and contribute to eventual recovery. EMS is achieving this, and therefore makes a direct contribution to injury severity reduction.

The 402 grant has served as a significant catalyst for increased State funding and program start-up. From 1967 to 1979, States allocated $142 million in 402 grants to EMS planning and operations, and augmented these grants by directly matching $426 million of their own resources. From 1967-1974 402 grants for EMS totalled $56.4 million. However, from 1975-1979 402 totalled $85.8 million. The annual amounts of 402 EMS rose almost 24 percent from 1975 to 1979. States continue to provide three dollars of their own funds for each dollar of 402 used. The 402 program has been closely coordinated

with the activities of the Department of Health, Education, and Welfare through an interagency agreement. HEW has been funding EMS activities complementary to those supported by NHTSA since 1973.

EMS responses to traffic accidents increased yearly from 1975 to 1979. Compared with National Safety Council (NSC), Federal Highway Administration (FHWA), and U.S. Public Health Service (PHS) estimates of disabling traffic injuries and traffic victims requiring medical attention, EMS reached a greater proportion of victims each year. Response times were cut in both urban and rural communities, and victims were generally reached in the recommended times of 5 to 7 minutes urban and 25 to 30 minutes rural. Certain rural areas in this country remain beyond 30-minute capability, and 403 program efforts earmark rural response improvement as the top priority in EMS research and demonstration work. New developments will be transferred through the 402 program for State use.

Table V-10 indicates the number and percentages of States implementing the major elements of the EMS program standard. The data for 1966 covers the 50 States, the District of Columbia, and Puerto Rico. The data for 1974 and 1979 add three more jurisdictions: American Samoa, Guam, and the Virgin Islands.

**TABLE V-10**
**EMS Standard Implementation Status**

| Key EMS Standard Elements | 1966 NUM | 1966 PCT | 1974 NUM | 1974 PCT | 1979 NUM | 1979 PCT |
|---|---|---|---|---|---|---|
| EMS Personnel Requirements | 2 | 4 | 33 | 60 | 49 | 89 |
| Vehicle Requirements | 2 | 4 | 33 | 60 | 47 | 85 |
| System Coordination Requirements | 4 | 8 | 32 | 58 | 46 | 84 |
| First Aid | 25 | 48 | 47 | 85 | 54 | 98 |
| 2 Way Communications Criteria | 7 | 13 | 38 | 69 | 47 | 85 |
| Aid Request Response | 12 | 23 | 40 | 73 | 50 | 91 |
| Comprehensive Planning | 1 | 2 | 46 | 84 | 51 | 93 |

There is apparent agreement among the States that this Standard does contribute to a reduction of fatalities, and that injuries are minimized. This had been accomplished by improvements in prehospital treatment brought about by better vehicle and equipment standards and through standards for the training of emergency medical technicians, including paramedics.

In 1974 EMS services made 2.3 million traffic accident responses and managed an additional 12.2 million responses to other medical emergencies and situations requiring patient transportation. By 1979 responses had risen to 2.8 million and 14.8 million for traffic and other accident/illness victims, respectively.

Thus, the operational capability of EMS, measured in terms of traffic accident responses, exceeded the NSC estimate of almost 2 million disabling injuries in the 1977-1978 time period, and almost reached FHWA estimates of about 3 million motor vehicle injuries. Using various levels of injury reported by PHS surveys, traffic injuries of the more serious type and lesser injuries

also requiring some form of medical attention range between 3 million and 4.2 million yearly. Regardless of which level is chosen for analysis, EMS responses are closing the gap, and observers generally conclude that EMS is reaching all the serious traffic injuries and a growing proportion of the less severe ones. The significance of these improvements is clear when you consider that traffic responses still represent only about one in five of their emergency calls. The system as a whole is increasingly productive and effective, as indicated by additional equipment, training and communications trends.

EMS capability has improved as the system's components have evolved. Although the number of services declined from 18,000 in 1969 to 14,000 in 1979, overall response capability increased substantially. The number of better trained and equipped volunteer and municipal emergency services increased, while less capable private and ambulance services that predominated in traffic accident responses in earlier years declined. Volunteer and public services increased from 73 percent of total EMS in 1974 to 80 percent in 1979, while private services responding to traffic victims dropped from 37 percent to 20 percent.

Although the number of ambulances in use has not grown significantly (starting at 28,000 in 1969, the number rose to 31,000 in 1975 and dropped to 29,000 by 1979), this trend has been more than offset by equipment and operational improvements. Ambulance design now meets standards recommended by NHTSA and medical authorities. Vehicle configuration offers access to patients for continued care enroute to emergency rooms. Communications and telemetry between dispatchers, EMTs and physicians are available on-board. By 1979 90 percent of the EMS ambulances were in two-way communication versus 74 percent in 1975 and 48 percent in 1969. This helped increase accident responses and reduce response time to the accident scene. States allocated significant amounts of 402 funds, matched by their own funds, to the purchase of both vehicles and communications equipment.

The 402 program has provided States with leadership, technical assistance and instructional courses to improve rescue and patient care skills now widely in use by EMTs, police and fire services, and the military. By 1979 85 percent of the 306,000 active ambulance personnel had received instruction in the DOT 81-hour Basic Care Course, up from 50 percent in 1974 and 13 percent in 1969. NHTSA studies indicate that 30 percent of the 402 funds spent in EMS have been devoted to training.

Management to support the operational improvements witnessed since 1969 has been initiated and upgraded largely through the use of 402 grants and matching State commitments. State and Regional plans to develop and coordinate EMS services and response capability have evolved, and program needs are now surveyed on a continual basis. Comprehensive plans have resulted. Every State has created a State-level organization and coordinator to plan and administer EMS. A number of States have enacted legislation to facilitate EMS and the use of advanced care. And, States are increasingly covered by the telephone "911" central dispatch of all emergency services, including EMS. (Note: By 1979 26 percent of the U.S. populace was under "911." About 70 new systems come into use each year, and each extends coverage on the average to an additional 150,000 people.)

## Pedestrian Safety

Each year, approximately 16 percent of all traffic fatalities are pedestrians averaging 7,700 deaths per year, with over 60 percent occurring in urban areas. The problem identification activity at the State level has led to the identification of two groups of pedestrians that are significantly involved in accidents -- young persons 5 to 14 years and older persons 65 years and over. The direct result of this problem identification activity is the increase in 402 funds for pedestrian safety programs. Funds obligated for pedestrian safety have tripled since FY 1975 -- from $1.3 million in FY 1975 to $3.8 million in FY 1979. The fatality involvement of pedestrians from 5 to 14 years of age dropped from 17 percent in 1975 to 14 percent in 1978, with fatality involvement of elderly pedestrians 65 years and over dropping from 25 percent in 1975 to 21 percent in 1978.

Since 1966 most of the elements of the pedestrian standard have been implemented by the majority of States:

TABLE V-11
**Pedestrian Safety Standards Implementation Status**

| Key Pedestrian Safety Standard Elements | Number of States 1966 | 1974 | 1979 |
|---|---|---|---|
| Accident Information on Location | 36 | 49 | 54 |
| Accident Information on Age | 38 | 49 | 54 |
| Accident Information on Pedestrian BAC | 12 | 45 | 48 |
| Pedestrian Education -- Schools | 21 | 46 | 49 |
| Pedestrian Education -- Public Media | 21 | 37 | 44 |
| Traffic Regulations | 29 | 42 | 47 |

With 33 percent of pedestrian fatalities resulting from persons appearing suddenly in a street from between parked cars some distance from an intersection, implementation of safety educational programs continues to be the best countermeasure for changing behavior, particularly for urban populations. Projects have been implemented to make physical changes such as: changing bus stop locations or fences to forbid jaywalking.

## Driver Education

Driver education must reach a broad range of persons needing training in safe behavior on the highways. Educational materials must be developed and programmed to service all classes of drivers, particularly, novice drivers. Special courses in evasive driving maneuvers are needed for police and emergency service personnel who must often operate their vehicles at high speeds in congested areas. The traditional 30-6 hour driver education course in high schools has been supplemented with increased use of simulators and driving ranges.

During the FY 1975-79 funding period, 402 obligations to assist in the implementation of the many educational programs designed for special target groups grew from less than $7 million to over $12 million in FY 1979. States and local jurisdictions continue to provide 95 percent of public secondary school driver education from such revenue sources as general revenue, driver license fees, forfeiture fines, local taxes and vehicle license tags. Since 1973 the average cost per driver education pupil has increased from $76 to $95, with States' reimbursement per pupil representing 50 percent of the cost.

The number of secondary school students eligible for driver education was 3,728,00 in FY 1975 and is estimated to reach 4,115,000 in FY 1979, a 10 percent increase. In FY 1975, 76 percent of eligible students received driver education, with 82 percent estimated for FY 1979.

Approximately 80 percent of secondary schools offer the traditional driver education course of classroom (30 hours) and behind-the-wheel (6 hours). In FY 1979, simulators are used by 16 percent of the schools and driving ranges are available at seven percent of the schools. In the FY 1975-79 period the number of driving simulators has doubled from 2,200 to 4,436 and the number of driving ranges has increased by 27 percent from 890 to 1,127. The number of eligible students trained on simulators and/or ranges increases about 15 percent each year, and studies in five States indicate that well-scheduled use of simulators and ranges can reduce the costs of behind-the-wheel instruction.

Full-time driver education instructors in secondary schools doubled between FY 1975 and FY 1979, which growth was also the case with certified commercial driving school instructors. Over 700 colleges offered driver education teachers preparation courses in FY 1979, a 70 percent increase over FY 1975, which is increasing the number of instructors, each year, who receive 12 or more hours of training.

**Driver Licensing**

NHTSA's 402 program in driver licensing is designed to assist States to grant driving privileges only to qualified persons, promptly identify unsafe drivers, improve driver performance, and establish tighter licensing controls. During the FY 1975-79 period, 402 obligations gradually decreased as additional States assumed more of the capital costs for manpower and equipment to attain established objectives (from $3.26 million (3.9% of total 402 obligations) in 1975 to $2.97 million in FY 1979 (1.8% of total 402 obligations)).

Driver Licensing has evolved over the years from a casual accounting of vehicle operations into a comprehensive system that includes driver knowledge, vision and physical fitness testing, more accurate identification procedures, more rationally based restrictions for safety reasons, and a specific linking of driver with vehicle types or classes. Driver licensing programs are emphasizing improvement of driver competence upon entry and at a time of license renewal, the rehabilitation of problem drivers and improvement of operator license testing.

While much remains to be accomplished, particularly in tracing drivers between States as discussed in the recent report to Congress on the National Driver Register, Federal 402 funds have and are contributing to such improvements as indicated below:

TABLE V-12
**Driver License Standard Implementation Status**

| Key Driver License Standard Elements | Number of States 1966 | 1974 | 1979 |
|---|---|---|---|
| Classified Licenses | 3 | 24 | 27 |
| Automated Test Equipment | 0 | 25 | 33 |
| Medical Advisory Boards | 39 | 43 | 49 |
| Periodic (4 yr.) Re-exams | 4 | 29 | 30 |
| Motorcyclists Special License | 6 | 35 | 44 |
| Driver Improvement Programs | 39 | 50 | 55 |

The number of licenses in force increase an average of three percent each year, paralleling motor vehicle registration growth. In 1979 it is estimated that over 146 million licenses will be in force compared to 125 million in 1974. Drivers, 24 years of age or under, represent 22 percent of licenses in force; an estimated 32 million in 1979 compared to 28 million in 1974. This requires an increase in enforcement effort on the nation's highways, since this age group is 15 percent overrepresented in accident/violation involvement.

**Pupil Transportation Safety**

With the exception of police traffic services, pupil transportation represents the largest investment of State resources due to the huge capital outlay involved. It is estimated that annual expenditure of public funds for pupil transportation in the 1978-79 school year will be $3,500 million, compared to a 50 percent increase in the number of vehicles used and the number of pupils transported. A determining factor in the State expenditure growth is the increased cost of vehicle operation. In 1965-66, the average annual operation cost per vehicle was $3,305 compared to an estimated $10,677 in 1978-79; a 223 percent increase to cover maintenance, inspection, fuel, drivers, etc. As may be expected, the average annual cost per pupil followed the growth in vehicle costs; the per pupil cost in 1965-66 of $43.40 has increased 230 percent to $142.94 estimated for 1978-1979.

Sources for pupil transportation funding, by percent, approximate 56 percent from local jurisdiction budgets, 42 percent from State budgets and two percent from Federal funds. Base 402 funds obligated for school bus safety dropped from $1.0 million in FY 1974 to $0.6 million in FY 1979. From FY 1976-78, Congress earmarked an additional $21.5 million under USC 23 406 for school bus driver training, of which $17.8 million, or 83 percent, has been obligated thru FY 1979. Since the average rate of turnover of school bus drivers approximates 60,000 per year, or 15 percent, these Section 406 funds contributed about $75 toward the training of each new replacement driver, with State/local budgets carrying the remaining cost of public school bus operations.

One measure of the Federal, State, and local dollar obligations, is the annual usage of public school vehicles, shown in Table V-13:

**TABLE V-13**
**Annual Public School Bus Usage**

| School Year | 1973-74 | 1974-75 | 1975-76 | 1976-77 | 1977-78 | 1978-79 |
|---|---|---|---|---|---|---|
| School Bus Operated (thous.) | 271.6 | 282.8 | 312.0 | 298.2 | 318.4 | 329.3 |
| Pupils Transported (million) | 21.2 | 22.4 | 22.8 | 23.2 | 24.0 | 24.6 |
| Vehicle Miles Travel (million) | 2,450.0 | 2,500.0 | 2,862.0 | 2,950.0 | 3,156.0 | 3,340.0 |
| Vehicle Miles Travel-Rural (%) | 79.0% | 78.0% | 69.0% | 69.0% | 69.0% | 70.0% |

Public schools operate approximately 77 percent of all vehicles registered as school buses. The number of school buses increased 21 percent from 1974 to 1979, while pupils transported increased 16 percent, and vehicle miles travelled 36 percent. School bus miles of travel, during the five-year period, has shifted nearly ten percent from rural to urban areas, following population trends.

Studies conducted in at least ten States identify school bus driver error as a major causative factor in crashes. The lack of trained drivers (60 percent trained in 1978-79) has contributed to about 260 crashes per school day, with 247 fatalities occurring in 1978-79. Of the 247 fatalities, only 23 were school bus occupants, but 89 were nonoccupant pupils approaching or leaving the bus.

According to data reported by States to the Natonal Safety Council, the national average of school bus accidents per million vehicle miles of travel has increased from 7.1 in the 1966-67 school year to 10.6 in the 1976-77 school year, with an 11 year average of 8.8. (For comparison purposes, the city bus rate per million miles of travel in 1977 was 60.6). Since the number of school buses operated, and pupils transported, increase over three percent per year, it may be expected that the school bus accident rate will increase, unless the percent of drivers trained can be increased beyond the current 60 percent level.

**Traffic Records**

The goal of the traffic records program is the establishment of data systems in the States which are responsive to the needs of all users, particularly for those who manage, implement or evaluate overall highway safety programs.

From FY 1967 through FY 1974 over $64 million of 402 funds were obligated to assist States in modernizing and improving the operational efficiency of traffic-related data files. The major programming effort was conversion of manual files on drivers, vehicles, and accidents into automated files with rapid entry and retrieval.

Between FY 1975 and FY 1979 an additional $31 million of 402 funds were obligated, primarily to provide the necessary personnel skills, on-line capabilities, uniformity and reliability of data and subsystems integration to improve the quality of information and response time for law enforcement and other user inquiries.

In the period from FY 1967 through 1979 the number of States with automated driver files increased from 12 to 49, the number of States with automated vehicle files from 12 to 45, the number of States with automated accident files from 9 to 52 and, those States with rapid response to driver and vehicle queries from 17 to 46. Today, it is commonplace to see drivers records retrieved and displayed instantaneously on terminals at driver examining offices or traffic courtrooms. An enforcement officer on patrol can receive immediate feedback when checking the status of a vehicle he is pursuing or a driver he has apprehended. The NHTSA has assigned a high priority to traffic records. Areas needing improvement are: accident investigation, uniformity of data elements and integration of various subsystems such as the vehicle and driver file.

It is encouraging to note that while, between FY 1975 and FY 1979 the average annual increase in 402 obligations was 8.6 percent, the State/local matching dollar share has increased an average of 17.2 percent each year, and is 2½ times the 402 obligation in FY 1979.

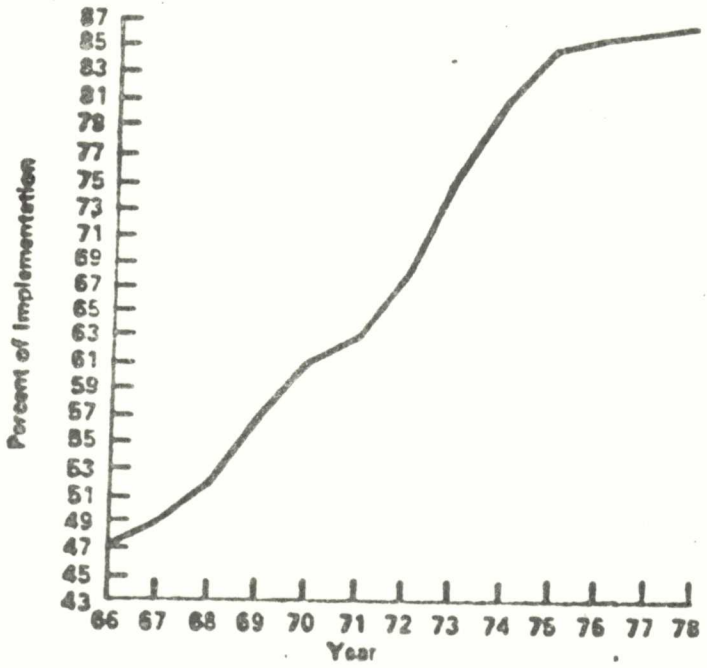
## Implementation of Federal Standards

Since the initiation of the 402 program, the implementation of standards has offered a major method of creating 402 catalytic effect. The 14 plus standards -- the majority of which Congress provided in the 1966 Act -- constituted the original framework for developing an effective national safety program and for guiding the expenditure of 402 funds.

Figure V-2 shows the National Average Standards Implementation. As seen in the graph, implementation of the standards has dramatically increased from a low of 47 percent in 1966 to 87 percent in 1978.

FIGURE V-2

National Average Implementation of the Standards 1966-1976
Chart #1




The standards retain an unique importance in this process. They offer a comprehensive framework of sound measures to alleviate both safety and safety delivery problems. As such, they offer States a valuable starting point in the search for effective countermeasures to fund.

## Overall Growth and Stimulus Effect

The record of the 402 program has certain interesting and exemplary characteristics. For example, 402 has made a contribution that far outreaches its proportionate financial share in the U.S. safety effort. It has an impact on State and local efforts in thousands of locales, and under varying political and social conditions. Unlike many social programs with larger appropriations, 402 grants and technical assistance are used by a large number of State and local agencies, and in all areas associated with the use of private and commercial motor vehicles.

Finally, this report on the growth and stimulus effect of the 402 program demonstrates that the spending of public money and the setting of program objectives and standards to stimulate governmental units into action does bring results. Program activities cited in this report represent a new and growing acceptance of responsibility by State and local officials to provide solutions for the traffic loss problem.